

SCREENCHECK DRAFT

BENICIA BUSINESS PARK
ENVIRONMENTAL IMPACT REPORT



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Submitted to the:

CITY OF BENICIA

Prepared by:

LSA ASSOCIATES, INC.

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May 18, 2000

John Bunch
Planning Director
City of Benicia Planning Department
250 East L Street
Benicia, CA 94510**RE: Benicia Business Park Screencheck Draft EIR**

Dear John:

We are pleased to submit seven copies of the Screencheck Draft EIR for the Benicia Business Park Master Plan. One copy of the document was sent directly to David Dolter at Seeno. We have also enclosed the City's comment copy of the Administrative Draft to aid in your review of the Screencheck draft. We were able to respond to many of the comments received from the City and the applicant. Suggested modifications to the cultural resources section are shown in highlight. We did not receive improved graphics from the applicant and have instead modified the earlier graphics to improve their legibility, where possible.

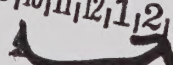
Unfortunately, our schedule and late arrival of some information did not permit partial submittal of the Screencheck Draft. Our current schedule calls for a two week city review of the Screencheck. We are looking forward to receiving a single consolidated version of edits to the Screencheck Draft EIR by June 2. We call your attention to schedule so that we may avoid delays. We may require additional lead time to turn around documents if schedule delays occur.

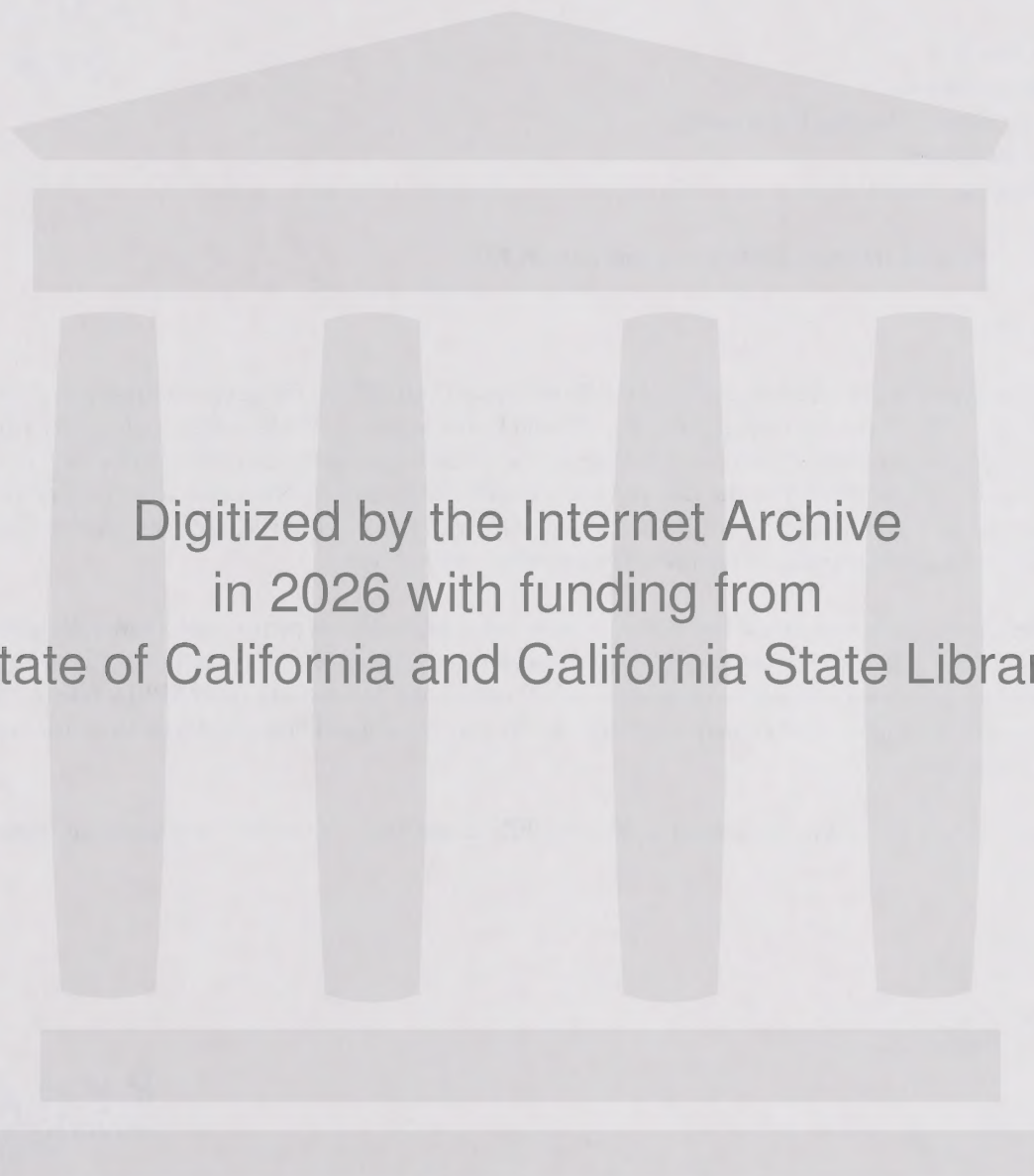
We are looking forward to publication of the Draft EIR in mid-June. If you have any questions, please call me or Sheila Brady.

Sincerely,
BRADY • LSASandia Potter
Project Manager

Enclosures

cc: David Dolter, Albert D. Seeno Construction

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BENICIA BUSINESS PARK

ENVIRONMENTAL IMPACT REPORT

Submitted to the:

CITY OF BENICIA

Prepared by:

LSA ASSOCIATES, INC.

In Association with:

BASELINE ENVIRONMENTAL CONSULTING

ENVIRONMENTAL VISION

FEHR & PEERS ASSOCIATES

MAY 2000

LSA

BENICIA BUSINESS PARK EIR

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Chapter I INTRODUCTION

■ ■ ■

A. Purpose of the EIR

In compliance with the California Environmental Quality Act (CEQA), this report describes the environmental consequences of the proposed subdivision and development of the Benicia Business Park Site (the Project site). This Draft Environmental Impact Report (EIR) is designed to fully inform City decision-makers, other responsible agencies, and the general public of the proposed Project and the potential consequences of Project approval. The EIR also evaluates various alternatives to the proposed Project, and recommends a set of mitigation measures to reduce or avoid potentially significant impacts.

This Draft EIR will be circulated to agencies and the public for a 45-day review period. A Final EIR will be prepared that responds to public comment and contains the project mitigation monitoring program. The Final EIR will be available at Benicia City Hall for public review. The Draft EIR and Final EIR will be used by City staff, the Planning Commission, the public, and the City Council in their review of the proposed Project.

B. Proposed Project

The Benicia Business Park site is located in the northeastern portion of the City of Benicia in Solano County. The City of Benicia is the Lead Agency under the provisions of CEQA for this Project.

The 527.5 acre site is currently undeveloped grazing land. The site is bounded by East Second Street and Lake Herman Road. Surrounding land uses include industrial uses along Industrial Way and East Second Street, commercial uses at the I-680 and East Second Street interchange, utility uses associated with the City's water treatment plant, and undeveloped land.

This Draft EIR analyzes three proposed actions:

- **Master Plan Overlay Zoning.** A Master Plan is allowed by the City of Benicia Zoning Ordinance Section 17.68 for properties with any base zoning district under common ownership which aggregate to more than 40 acres. The Master Plan Overlay Zoning change may be initiated by the City Council, Planning Commission, or property owners. Although an overlay zoning district is not specifically required, a Master Plan is required to be prepared on all properties over 40 acres by Benicia General Plan Policy 2.3.1. The goals of the master plan process are to encourage the best, most effective, and most environmentally sensitive use of properties and to allow the City to project the need for and plan future public services and facilities.
- **Master Plan.** The proposed Benicia Business Park Master Plan locates commercial development at the eastern end of the Plan Area and industrial development in the central, southern and western portions of the site. An open space buffer area consisting of primarily undeveloped land is proposed along the south side of Lake Herman Road. The Master Plan proposes development of 284.8 acres of limited industrial uses; development of 45 acres of commercial uses; retention of four lots for open space (totaling 169.8 acres); and installation of two water tanks that would provide water supply for the proposed development. The applicant is Albert D. Seeno Construction Company, located in Concord, California.
- **Tentative Subdivision Map.** Subdivision of the 527.5-acre site into 69 lots (ranging in size from 1.36 acres to 11.35 acres) is proposed by the applicant. Six of the lots would be zoned for commercial uses and 63 lots would be zoned for limited industrial uses. In accordance with the City's Subdivision Ordinance, the project includes site grading, road construction, and utility installation to serve the newly created lots. The proposed Master Plan Tentative Map is shown in Figure III-2.

C. EIR Scope

An Initial Study was prepared for the proposed Benicia Business Park project during the scoping for this EIR. (The Initial Study is provided in Appendix A.) The analyses contained in the Initial Study determined the focus of this EIR. The City circulated a Notice of Preparation (NOP) that described the proposed Project and identified the areas of concern associated with the proposed action. The NOP was published on March 30, 1999 and mailed to public agencies and organizations considered to be likely to be interested in the potential impact of the Project.

Comments in response to the NOP were received by the City and considered during the preparation of this EIR. The NOP comments are provided in Appendix B.

This Draft EIR focuses on the areas of concern identified in the Initial Study and the responses to the NOP. The following environmental issues are addressed in this EIR:

- A. Land Use and Policy
- B. Geology, Soils, and Seismicity
- C. Hydrology and Water Quality
- D. Hazardous Materials
- E. Biological Resources
- F. Transportation and Circulation
- G. Air Quality
- H. Visual Quality
- I. Cultural Resources

D. Report Organization

This EIR is organized into the following chapters:

- *Chapter I – Introduction:* Discusses the overall EIR purpose; provides a summary of the proposed action; identifies the focus of the environmental evaluation; and summarizes the organization of the EIR.
- *Chapter II – Summary:* Provides a summary of the impacts that would result from implementation of the proposed Project and describes mitigation measures recommended to reduce or avoid significant impacts.
- *Chapter III – Project Description:* Provides a description of the Project objectives, Project site, site development history, required approval process, and details of the Project itself.
- *Chapter IV – Setting, Impacts and Mitigation Measures:* Describes the following for each environmental technical topic: existing conditions (setting); potential environmental impacts and their level of significance; and mitigation measures recommended to mitigate identified impacts. Potential impacts are identified by levels of significance, as follows: significant and unavoidable impact (SU), significant impact (S), and less-than-significant impact (LTS). Each impact is categorized before and after implementation of any recommended mitigation measure(s).
- *Chapter V – Alternatives:* Provides an evaluation of two alternative development scenarios, the Mixed-Use and the Mitigated alternatives, for the proposed Project, in addition to the No Project Alternative.

- *Chapter VI – CEQA Required Assessment Conclusions:* Provides the required analysis of the overall impacts of the proposed Project, including growth-inducing effects, significant unavoidable impacts, cumulative impacts and mitigation measures, and effects found not to be significant.
- *Chapter VII – Report Preparation:* Identifies persons and organizations contacted, references used, and preparers of the EIR.

Chapter II SUMMARY

■ ■ ■

A. Project Under Review

This Draft Environmental Impact Report (EIR) has been prepared to evaluate the environmental impacts of the proposed Benicia Business Park project. The proposed Project includes subdivision of the 527.5-acre Project site into 69 lots for development of limited industrial and commercial land uses. Approximately 170 acres would be retained as open space. The Project also includes grading and installation of roadways, water, sewer, utilities and two water tanks. A detailed description of planned modifications and Project phasing is provided in the next Chapter of this EIR.

B. Summary of Impacts and Mitigation Measures

Table II-1 summarizes significant adverse impacts and mitigation measures of the Benicia Business Park Master Plan. A detailed discussion of the affected environment and the environmental consequences of alternative development scenarios are contained in Chapter IV. Impacts that were determined to be less than significant are also discussed in each topic section, but are not included in Table II-1.

Significant impacts that were identified in each environmental topic section in Chapter IV have been assigned numbers. For example, damage caused by strong seismic shaking at the site during the expected earthquakes was identified as a potential impact and is numbered GEO-1. The mitigation measure recommended to reduce the environmental effects of that impact is numbered "Mitigation Measure GEO-1". The following abbreviations are used throughout the EIR for each topical section:

LU = Land Use and Policy
GEO = Geology, Soils and Seismicity
HYDRO = Hydrology and Water Quality
HAZ = Hazardous Materials

BIO = Biological Resources
TRAN = Transportation and Circulation
AIR = Air Quality
VIS = Visual
CULT = Cultural Resources

Significant impact statements are shown in bold in the text and are reproduced in Table II-1. The impact statement is followed by a parenthetical symbol indicating the level of significance for each impact. A similar symbol is used to indicate the level of significance of the impact after implementation of the mitigation measure. These symbols are:

S = Significant Impact
LTS = Less Than Significant Impact
SU = Significant Unavoidable Impact

**Table II-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
A. LAND USE AND POLICY			
<u>LU-1</u> : The proposed Project could conflict with some policies of the General Plan related to open space and scenic resource maintenance.	LTS	<u>LU-1</u> : The Project applicant should provide a funding mechanism to ensure long-term maintenance of the permanent open space areas dedicated as part of the Project. Funding mechanisms could include formation of a business owners association. Preparation and City approval of an open space maintenance plan shall be required as part of the final subdivision map.	LTS
B. GEOLOGY, SOILS, AND SEISMICITY			
<u>GEO-1</u> : Damage caused by strong seismic shaking at the site during the expected earthquakes on regional faults could cause injuries and/or fatalities and structural and nonstructural damage to the proposed structures within the Master Plan Area.	S	<u>GEO-1</u>: The following mitigations to reduce the impacts of expected strong seismic shaking at the Master Plan Area shall be implemented: • All structures shall be designed and constructed in conformance with the most recently adopted California Building Code requirements for seismic design. • The applicant shall incorporate all recommendations of the geotechnical investigation (ENGEO, 1998) into the Project design. The potential for damage during strong seismic shaking cannot be eliminated. A similar potential for seismically-induced damage affects most areas within the San Francisco Bay region that are located near major active faults. However, the proposed Project would draw a substantial number of people to an area of high seismic risk, exposing them to injury. The above mitigation measures would reduce, but not eliminate, the severity of impact associated with seismic shaking. However, the risk of earthquakes and associated damage is generally accepted in the Bay Area and institutional controls such as the Benicia Emergency Response Plan, have been emplaced to reduce the risks to acceptable levels.	LTS
<u>GEO-2</u> : Damage to structures or property could occur at the Master Plan Area due to existing or induced slope instability resulting in landsliding.	S	<u>GEO-2</u>: Potential slope instability impacts associated with the proposed Project shall be mitigated by the following measures: • The applicant shall incorporate all recommendations of the geotechnical investigation regarding mitigation of slope instability into the Project design.	LTS

LTS = Less-than-Significant; S = Significant; SU = Significant Unavoidable.

Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
GEO-2 <i>continued</i>		- All grading plans, cut and fill slopes, compaction procedures, and retaining structures shall be designed by a licensed professional engineer and inspected during construction by registered professional engineer (or representative) or Certified Engineering Geologist (or representative). All designs shall be submitted to, and approved by, the City of Benicia prior to implementation; - The 40-scale grading plans, when prepared, shall be reviewed by a registered professional engineer, to ensure that the detailed plans conform with the intent of the preliminary geotechnical report. Implementation of this mitigation measure would reduce potential impacts associated with slope instability to a to a less-than-significant level.	
GEO-3: Potential long-term deformation related to construction of deep fills and potential failure of cut slopes could occur as a result of proposed development.	S	GEO-3: Potential impacts associated with cut and fill for the proposed Project shall be mitigated by the following measures: - The applicant shall incorporate all recommendations of the Project geotechnical investigation (ENGEO, 1998) regarding mitigation of potential problems associated with cut and fill into the Project design. - The applicant shall establish a self-perpetuating slope maintenance program (to be managed by a Master Plan Area business owners association or similar entity), that includes annual inspections of slopes, debris benches, and v-ditches. Any accumulation of slope detritus on the benches or in the v-ditches shall be promptly removed. The association would also be responsible for repair of any slope failures that may occur on the cut slopes along the northern portion of the site. An annual report documenting the inspection and any remedial action conducted shall be submitted to the City of Benicia Public Works Department for review. Implementation of this mitigation measure would reduce potential impacts associated with deformation of deep fills and maintenance of cut slopes to a to a less-than-significant level.	LTS
GEO-4: Damage to structures or property related to shrink-swell potential of Project soils could occur at the site.	S	GEO-4: Potential impacts associated with the moderate to high shrink-swell potential of soils within the proposed Master Plan Area shall be mitigated by the following mitigation measures: The applicant shall incorporate all recommendations of the Project geotechnical investigation (ENGEO, 1998) regarding mitigation of expansive soils into the Project design.	LTS

Designs for all common landscaped areas shall incorporate low water-need plantings to minimize the potential for damage associated to pavements, utilities, and structures from expansive soils. The use of similar landscaping should be encouraged at individual parcels by providing information to new tenants regarding the relationship between irrigation and subsequent property damage. A document, describing the potential for damage from expansive soils from over irrigation and includes solutions such as drought-tolerant plant material and drip irrigation systems, shall be prepared by the applicant/owner and provided to all occupants of the proposed commercial and industrial facilities.

Implementation of this mitigation measure would reduce impacts associated with shrink-swell soils to a less-than-significant level.

C. HYDROLOGY AND WATER QUALITY

HYDRO-1: Creation of new impervious surfaces could result in increased runoff volume from the site, potentially causing impacts to downstream flooding.

S

HYDRO-1: As a condition of approval of the final grading and drainage plans for the Project, detailed hydraulic analysis shall demonstrate that implementation of the proposed drainage plans would:

LTS

Not increase peak runoff rates from any subareas, or that there is no increase in combined peak runoff volumes from subareas draining to the same downstream conveyance component (i.e., reductions in one subarea can offset increases in another subarea, if they drain to the same downstream conveyance), or that the downstream conveyance has adequate capacity to handle the proposed increase. The final drainage plan for the Project shall be prepared by a licensed professional engineer;

- Include drainage components that are designed in compliance with City of Benicia standards. The grading and drainage plans shall be reviewed for compliance with these requirements by the City of Benicia Department of Public Works. Any improvements deemed necessary by the City, shall be part of the conditions of approval; and
- The applicant shall establish a self-perpetuating drainage system maintenance program (to be managed by a Project site business owners association or similar entity), that includes annual inspections of sedimentation basins, drainage ditches, and drainage inlets. Any accumulation of sediment or other debris shall be promptly removed, at the expense of the business owners' association. An annual report documenting the inspection and any remedial action conducted shall be submitted to the City of Benicia Public Works Department for review.

Implementation of this mitigation measure would reduce potential impacts associated with increased peak runoff volumes to a less-than-significant level.

LTS = Less-than-Significant; S = Significant; SU = Significant Unavoidable.

Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
HYDRO-2: Construction activities and post-construction site uses could result in degradation of water quality in creeks and the Carquinez Strait by reducing the quality of storm water runoff.	S	HYDRO-2: Prior to issuance of a grading permit, the applicant shall prepare a SWPPP designed to reduce potential impacts to surface water quality through the construction and life of the Project. The SWPPP would serve as the overall program document designed to provide measures to mitigate potential water quality impacts associated with implementation of the proposed Project. The SWPPP shall include: 1. Specific and detailed BMPs designed to mitigate construction-related pollutants. These controls shall include practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, adhesives) with storm water. The SWPPP shall specify properly designed centralized storage areas that keep these materials out of the rain. An important component of the storm water quality protection effort is the understanding of the site supervisors and workers about water quality impacts. To educate on-site personnel and maintain awareness of the importance of storm water quality protection, site supervisors shall conduct regular tailgate meetings to discuss pollution prevention. The frequency of the meetings and required personnel attendance list shall be specified in the SWPPP. The SWPPP shall specify a monitoring program to be implemented by the construction site supervisor, and must include both dry and wet weather inspections. City of Benicia personnel shall conduct regular inspections to ensure compliance with the SWPPP. RWQCB personnel, who may make unannounced site inspections, are empowered to levy considerable fines if it is determined that the SWPPP has not been properly prepared and implemented.	LTS

BMPs designed to reduce erosion of exposed soil may include, but are not limited to: soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales, and sediment basins. The potential for erosion is generally increased if grading is performed during the rainy season as disturbed soil can be exposed to rainfall and storm runoff. If grading must be conducted during the rainy season, the primary BMPs selected shall focus on erosion control, that is, keeping sediment on the site. End-of-pipe sediment control measures (e.g., basins and traps) shall be used only as secondary measures. If hydroseeding is selected as the primary soil stabilization method, then these areas shall be seeded by September 1 and irrigated to ensure that adequate root development has occurred prior to October 1. Entry and egress from the construction site shall be carefully controlled to minimize off-site tracking of sediment. Vehicle and equipment wash-down facilities shall be designed to be accessible and functional both during dry and wet conditions.

2. **Measures designed to mitigate post construction-related pollutants.** The SWPPP shall include measures designed to mitigate potential water quality degradation of runoff from all portions of the completed development. The specific BMPs that would be required of a project can be found in *San Francisco Bay Regional Water Quality Control Board Staff Recommendations for New and Redevelopment Controls for Storm Water Programs* (April, 1994). The selection of BMPs required for a specific project is based on the size of the development and the sensitivity of the area. In general, areas near surface waters (i.e., creeks, lakes, or the Bay) are considered sensitive areas by RWQCB. Passive, low-maintenance BMPs (e.g., grassy swales, porous pavements) are preferred. If the SWPPP includes higher maintenance BMPs (e.g., sedimentation basins, fossil filters), then funding for long-term maintenance needs must be specified (the City will not assume maintenance responsibilities for these facilities).

In addition, some of the individual industrial businesses (depending on the type of activity) which operate at the Project site may be subject to regulation under the General Industrial Activities Storm Water Permit administered by the Regional Water Quality Control Board. These businesses would be required to file a Notice of Intent to comply with General Permit, conduct site inspections, collect runoff samples, and file annual reports.

LTS = Less-than-Significant; S = Significant; SU = Significant Unavoidable.

Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
HYDRO-2 <i>continued</i>		3. Integrated Pest Management Plan. The applicant shall develop and implement an Integrated Pest Management Plan (IPM) for all common landscaped area, if any. The IPM shall be prepared by a qualified professional approved by the City. The IPM shall address and recommend methods of pest prevention and plant management that use pesticides as a last resort in pest control. Types and rates of fertilizer and pesticide application shall be specified. Special attention in the IPM shall be directed toward avoiding runoff of pesticides and nitrates into creeks, wetland mitigation areas, or leaching into the shallow groundwater table. Pesticides shall be used only in response to a persistent pest problem. Preventative chemical use shall not be employed. Institutional and biological approaches to pest control shall be fully integrated into the IPM with an emphasis toward reducing pesticide application. The City of Benicia Public Works Department shall review the SWPPP to ensure that the selected BMPs meet the intent of the General Permit. Implementation of this mitigation measure would reduce potential water quality impacts to a less-than-significant level.	
<u>HYDRO-3:</u> Proposed grading at the site will substantially alter surface water drainage patterns, placing several of the on-site creeks and/or drainage swales in buried culverts, potentially reducing the natural ability of the creek system to treat pollutants. D. HAZARDOUS MATERIALS <u>HAZ-1:</u> Transport, storage, or handling of fuels, lubricants, and other chemicals at the Project site for heavy machinery operation/maintenance during site development activities could result in hazardous materials releases.	S	<u>HYDRO-3:</u> Potential impacts to water quality can be adequately mitigated with a properly designed and implemented Storm Water Pollution Prevention Plan (SWPPP). Mitigation Measure HYDRO-2 requires the implementation of SWPPP.	LTS
<u>HAZ-2:</u> Proposed site development activities would increase the volume and types of hazardous materials transported, stored, and used within the Project site, causing a potential hazard to public health and safety.	S	<u>HAZ-1:</u> The contractor(s) overseeing the grading and Project site development shall prepare and implement a spill prevention plan for potentially hazardous materials to be used during development activities. The plan shall be prepared prior to the start of earth working activities. The plan shall designate an on-site employee(s) responsible for plan implementation and include types and quantities of hazardous materials, anticipated equipment needs and maintenance, temporary hazardous materials storage areas, emergency response procedures for hazardous materials releases, and procedures for contacting regulatory agencies in the event of a hazardous materials release. The spill prevention plan may be prepared as part of a Storm Water Pollution Prevention Plan (see Section C, Hydrology and Water Quality). <u>HAZ-2:</u> Compliance with applicable local, State, and Federal regulations for hazardous materials (including pesticides and herbicides) and hazardous waste transport, use, storage and worker training would protect against significant hazardous materials impacts from Project operations.	LTS

HAZ-3: Site workers involved in demolition activities within the Project site could be potentially exposed to lead-based paint and asbestos-containing building materials, potentially causing adverse health effects. Site workers involved in development activities could also be potentially exposed to other hazardous materials that may be present on-site.

S

HAZ-3a: The following measures would be implemented, as required by Federal, State, and local regulations, to ensure that potential exposure to hazardous building materials is reduced to a less than significant level.

LTS

1. The applicant shall ensure that a lead-based paint and asbestos survey is prepared by a qualified environmental professional (e.g., CDHS-certified Lead Inspector/Assessor, Certified Asbestos Consultant) for all buildings to be demolished. Representative colors, textures, and substrates of the buildings shall be included in the sampling.
2. The applicant shall ensure that specifications for the safe removal and disposal of asbestos and lead-based paint and other hazardous building material, if present, are prepared by a qualified environmental professional (e.g., AHERA-Accredited Project Designer and Certified Asbestos Consultant and CDHS-certified Project Designer for lead) based on the results of the surveys, and conducted by a certified contractor(s) prior to building demolition. The specification shall include the proper testing, packaging, manifesting, and transport of demolition wastes by trained workers to a permitted facility for disposal, in accordance with local, State, and Federal requirements.
3. The applicant shall ensure that a health and safety plan is prepared and implemented by a qualified environmental professional (e.g., Certified Industrial Hygienist, Certified Asbestos Consultant for asbestos, CDHS-certified Project Monitor/Supervisor for lead), for all workers involved in building removal or demolition activities. The purpose of the health and safety plan shall be to mitigate potential exposure of workers to asbestos, lead-based paint, or other hazardous building materials, if present. The plan shall specify training and certification requirements, air monitoring requirements, personal protective equipment for workers, engineering controls and work practices, housekeeping procedures, hygiene facilities, medical surveillance requirements, Project monitoring/supervision, required permits, and other items for protection of workers involved in demolition activities, and public health protection as required by local, State, and Federal requirements.

LTS = Less-than-Significant; S = Significant; SU = Significant Unavoidable.

Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
HAZ-3 <i>continued</i>		<u>HAZ-3b:</u> The unlabeled drum identified during the site reconnaissance shall be removed prior to site development activities. Prior to removal, the drum shall be examined, and if the drum is found to contain material, sample(s) of the drum shall be collected by trained workers for purpose of profiling the material prior to drum transport. Analysis of samples from the drum shall be conducted by a California-certified laboratory, under chain-of-custody procedures. Once the contents of the drum have been profiled, the drum with its contents shall be removed from the site and transported to an appropriate facility for recycling or disposal, as appropriate, in accordance with local, State, and Federal requirements for hazardous waste management, by trained workers.	
<u>HAZ-4:</u> Proposed development within the Project site would attract additional people to light industrial/commercial areas located near grassland areas, potentially contributing to an increased fire hazard.	S	<u>HAZ-4a:</u> The applicant shall prepare and implement a fire prevention and preparedness plan during site development activities. The plan shall be prepared prior to the start of earth working activities at the site. The plan shall designate an on-site employee(s) responsible for plan implementation and include potential fire hazards, emergency response procedures for fires including evacuation routes and places of safe refuge, and procedures for contacting emergency responders in the event of a fire. Workers involved in site development activities shall receive training in these procedures at the start of site development activities. The fire prevention and preparedness plan may be prepared as part of other required plans. <u>HAZ-4b:</u> Compliance with requirements for maintaining fire breaks, and other fire protection regulations (e.g., Uniform Fire Code, California Building Code) and the City's ongoing maintenance of fuel management in open space areas during Project operations, would reduce the potential impacts related to wildland fires to a level of less than significant.	LTS
<u>HAZ-5:</u> The proposed Project could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.	S	<u>HAZ-5:</u> The applicant shall contact the Benicia Fire Department and Benicia Police Department to ensure that development within the Project site is considered when the City's Emergency Response Plan is updated and for the purpose of ensuring that businesses within the Project site are notified of the Community Alerting System and appropriate access and egress locations are identified.	LTS

HAZ-6: Workers involved in site grading, earthwork, or demolition activities could encounter hazardous materials within the Project site, for example, unexploded ordnance, explosives, or other hazardous materials, potentially causing physical injuries, death, or other adverse health effects.

S

HAZ-6a: If any known or suspected unexploded ordnance or explosives is encountered during earthwork activities on-site, construction in that area shall be immediately halted and all personnel shall vacate the area. The contractor(s) shall then contact the 911 emergency system to report the emergency and request assistance. Unexploded ordnance/explosives discovery procedures shall be documented by the contractor(s) prior to the start of earthwork activities, posted in the work area, and discussed with all on-site personnel prior to work on the site. (These procedures may be developed as part of other required plans, see mitigation measures above).

LTS

The local responding agency (e.g., Benicia Police Department or Fire Department) shall contact the Department of the Army Explosive Ordnance Disposal Units and Sacramento District of the Army Corps of Engineers, as needed, to assist in removal of any identified unexploded ordnance or explosives, and to determine if further action is needed prior to the time that site development work resumes in the area. Work shall not resume in the affected area until the area is deemed safe to do so by the local responding agency, and/or the Department of Army Explosive Ordnance Disposal Unit or the Sacramento District of the Army Corps of Engineers.

HAZ-6b: If contaminated soil is encountered or suspected during site development activities (through soil discoloration or odor), all work shall halt in the immediate area and personnel shall immediately vacate the area. Soil samples shall then be collected by a qualified environmental professional (e.g., registered geologist, professional engineer) prior to further work in the area(s). The samples shall be submitted for laboratory analysis by a State-certified laboratory under chain-of-custody procedures. The analytical method(s) shall be selected by the environmental professional based on the suspected contamination and consideration of historical land uses of the site and any previous analyses completed for soil samples collected in the area(s), if applicable. The analytical results shall be reviewed by a qualified environmental professional (e.g., Certified Industrial Hygienist). The professional shall provide recommendations, as applicable, regarding soil management, worker health and safety training, and regulatory agency notifications, in accordance with local, State, and Federal requirements. Work shall not resume in this area(s) until these recommendations have been implemented.

E. BIOLOGICAL RESOURCES

BIO-1: The proposed project would result in the fill of 4.56 acres of jurisdictional wetlands and 0.13 acres of other waters of the U.S.

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BIO-1a: The project proponent shall obtain the appropriate federal and state permits authorizing fill of wetlands or waters and work in streams in compliance with all terms and conditions of the permits.

LTS

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Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
BIO-1 <i>continued</i> <i>remedial measures</i> <i>contractor education</i>		BIO-1b: The project proponent shall implement the wetland mitigation and monitoring plan (Sycamore, 2000) as mitigation for impacts to jurisdictional wetlands. This plan, in its entirety, is incorporated into this mitigation measure by reference. This plan details the mitigation design, wetland planting design, maintenance and monitoring requirements, reporting requirements, and success criteria. This plan must be approved by the Corps and the City prior to implementation. A total of 9.43 acres of in-kind jurisdictional wetland habitat will be created on-site, consisting of approximately 3.17 acres of willow scrub habitat and 6.3 acres of freshwater marsh/seasonal wetlands. This represents a mitigation ratio of slightly over 2:1. As detailed in the plan, created wetlands will be monitored for a minimum of 5 years. Annual monitoring of each site will include 1) observation of existing and developing problems and recommendations for remedial actions; 2) an assessment of creation of wetland habitats; 3) a formal wetland delineation in year 5; 4) notation of invasive exotic species; 5) measurement of willow survival ; and 6) photo-documentation. Monitoring visits will be made in the winter and spring of each year and quantitative data will be collected in the spring. Annual reports will be submitted each fall to the Corps and the City for review. At the end of the 5-year monitoring period, the Corps and the City will review the reports and determine if the success criteria have been met. If the success criteria have not been achieved, then the maintenance and monitoring period may be extended until such time as the success criteria are met. <i>or agencies satisfied</i> BIO-1c: During construction, wetlands to be preserved shall be clearly marked with flagging and /or construction fencing. The project restorationist shall be on-site during construction to provide direction and ensure protection of sensitive resources. <i>perform periodic site visits to ensure compliance</i>	

		BIO-1d: During project construction, no material shall be allowed to enter, or be stored, in any wetlands that are to be preserved. Project related dirt and other material shall be kept sufficiently far away from preserved wetlands and drainages to prevent material from entering these features. If earthmoving activities or material stockpiling occurs upslope from a preserved wetland or drainage, silt fencing will be installed around the preserved feature to prevent soil from entering the wetland or drainage. Silt fencing shall be installed at the least 5 feet from the edges of preserved wetlands and drainages. Silt fencing should also be installed around preserved features whenever earthmoving activities or material stockpiling occurs within 20 feet of a preserved feature. All equipment washing will occur downslope from preserved wetlands to prevent the run-off from entering the preserved wetlands. Berms or other barriers be constructed outside of preserved wetlands or drainages to prevent wash water run-off from entering the preserved wetlands. BIO-1e: Upon project completion, all preserved and created wetland areas shall be revegetated with locally adapted, native plant species as described in the approved wetland mitigation and monitoring plan (Sycamore, 2000). BIO-1f: A conservation easement shall be established around the created wetlands to preserve these wetlands in perpetuity. The City or other public resource agency shall hold the easement to ensure retention of this land in perpetuity. BIO-1g: The project proponent shall provide financial assurances of a type (i.e., bond, letter of credit) and amount to be determined by the Corps and the City to ensure successful implementation of the mitigation and monitoring plan. The project proponent shall also negotiate a long-term funding mechanism for the maintenance of the wetlands in the conservation easements in perpetuity. — No!	sharf sharf ?
	<i>& preserved</i> <i>If project proceeds mitigation</i>	→	
BIO-2: The proposed Project could result in indirect impacts to the Suisun Marsh.	S	BIO-2: The applicant shall implement mitigation measures to minimize runoff from the site as specified in Section C, Hydrology and Water Quality, of this EIR. Mitigation would include preparation of a Stormwater Pollution Prevention Plan, which would provide measures to manage runoff from the Project site.	LTS
BIO-3: The proposed Project could adversely affect 21 special-status plant species that could occur in wetlands and grassland habitats on the Project site.	S	BIO-3: Conduct surveys during the flowering season of each species to determine if identified special status plants are present. Surveys conducted to date were inconclusive for the 21 species listed in Table IV.E-1 due to the timing of the surveys. Additional surveys are necessary to determine the presence or absence of these species on-site. If special-status plants are found on-site during subsequent surveys (likely to be conducted in the spring and summer of 2000), measures to mitigate for impacts to the plant populations would be implemented. These measures could include avoidance of the rare plant populations or collecting plants or seed from the site for transplantation in mitigation areas. Mitigation measures would be detailed in a rare plant mitigation plan subject to approval by the City and CDFG.	LTS

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Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
<u>BIO-4:</u> The Project could result in the removal of trees that provide nesting habitat for white-tailed kites and other raptors.	S	<u>BIO-4:</u> Prior to construction, a qualified biologist familiar with raptors shall conduct surveys to determine the status of nesting raptors on the site. If white-tailed kites or other tree-nesting raptors are found nesting, the nest tree(s) shall be protected from disturbance during the nesting season. A temporary fence shall be placed around each active nest tree, at a minimum of 300 feet from the drip-line of the tree(s) and all construction activities shall be excluded from the fenced area. Tree protection measures shall remain in effect until a qualified biologist verifies that the adults have abandoned the nest or the young have left the nest and the nest tree.	LTS
<u>BIO-5:</u> The proposed Project could result in the loss of nesting and foraging habitat for burrowing owls in the Project vicinity.	S	<u>BIO-5a:</u> Conduct comprehensive pre-construction surveys for burrowing owl presence no more than 30 days prior to ground disturbing activity. <u>BIO-5b:</u> If burrowing owls are found on the site, the project proponent will notify the City and the California Department of Fish and Game. A qualified biologist ^{shall} will established an exclusion zone around each occupied burrow in which no construction-related activity will occur until the burrows are confirmed to be unoccupied. The exclusion zone will be 160 feet (50 meters) in diameter during the non-breeding season (September 1 through January 31) and 250 feet in diameter (75 meters) during the breeding season (February 1 through August 31) . The project proponent (or their biological consultant) will then consult with the California Department of Fish and Game regarding implementation of avoidance or passive relocation methods . All activities will be approved by and coordinated with the California Department of Fish and Game prior to disturbance of the burrows. The project proponent will also negotiate an appropriate mitigation plan consistent with California Department of Fish and Game policies at that time. Mitigation may include permanent protection of foraging habitat around the burrow of each pair or unpaired burrowing owl; or the permanent protection of habitat at a nearby off-site location acceptable to the CDFG.	LTS

BIO-6: The proposed Project could impact three special-status bat species that may roost in the abandoned buildings on-site.

F. TRANSPORTATION AND CIRCULATION

TRAN-1: The Project would cause intersection levels of service (LOS) to fall from LOS D or better to LOS E or worse at 7 of the 13 study intersections.

S

BIO-6: Prior to demolition of the buildings, a qualified biologist familiar with bats shall conduct a survey to determine the status of these and any other special-status bat species on the project site. If special-status bats are found, a biologist familiar with **relocating bats** shall be consulted regarding the best methods to remove bats from the buildings. This could include removing sections of the walls and roofs, which would discourage bats from continuing to roost in the buildings. Activities to relocate bats will be subject to approval by the California Department of Fish and Game. If a maternity colony of these species is found, the building and the bats shall not be disturbed until the young have dispersed (parturition and rearing of young typically occurs between March and September).

No mitigation is required for common species of bats. However, if common bat species are found roosting in the buildings, similar measures could be employed to minimize harm to these bats.

LTS

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TRAN-1: The following mitigation measures would bring the intersections up to LOS D or better operation with Project traffic. The mitigations are illustrated in Figure IV.F-10. Note that these mitigations represent improvements *above those identified in the General Plan (with modifications as noted above)*. The mitigations include:

- I-780 Eastbound Ramps/East Second Street. Add a second westbound right-turn lane (on the off-ramp).
- I-780 Westbound Ramps/East Second Street. Add a second southbound right-turn lane. (This second westbound left-turn lane is needed even without Project traffic, and so is not a Project mitigation measure.)
- East Second/Industrial. On the northbound approach, add one left-turn and one through-lane; on the eastbound approach, add one through lane and one right-turn lane; on the southbound approach, add one through lane.
- I-680 Southbound Off-Ramp/Lake Herman. Convert a southbound left-turn lane to a shared left-right lane.
- I-680 Northbound Ramps/Lake Herman. Add a southbound right-turn lane, a second northbound left-turn lane, and convert the eastbound through lane to a shared through-right (and add an acceptance lane on the on-ramp).
- Park/Industrial. Add a second northbound left-turn lane; convert the southbound right-turn lane into a shared through-right lane.
- I-680 Southbound On-Ramp/Bayshore. Add a westbound through lane; convert the eastbound through lane to a shared through-right (with an acceptance lane on the on-ramp).

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Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
<i>TRANS-1 continued</i>		With these improvements, in addition to those already foreseen in the General Plan, these intersections are projected to operate at LOS D or better. Table IV.F-7 shows the mitigated service levels. The Project applicant shall pay for, and the City shall construct, the improvements described above. The costs of the improvements shall be collected prior to the approval of the project. The timing of individual intersection improvements or roadway widenings shall be determined through project-specific traffic studies for buildings as they are proposed. The design of the improvements may change based on the outcome of these studies, but the improvements identified will be funded by the applicant's payments.	
<u>TRAN-2:</u> Traffic generated by the Project would create the need for a free-right lane at East Second Street/Rose Drive.	S	<u>TRAN-2:</u> The Project applicant shall include the cost of constructing a free right-turn lane on Southbound East Second Street, along with a westbound acceptance lane on Rose Street, in the mitigation funding program to be developed as part of Mitigation Measure TRAN-1.	LTS
<u>TRAN-3:</u> Traffic generated by the Project would contribute to cumulative traffic impacts by using capacity at all but two of the study intersections, all of which require some form of improvement to accommodate projected future traffic volumes.	S	<u>TRAN-3:</u> The Project applicant shall contribute a fair-share amount toward the cost of making the improvements identified in Impact TRAN-3, to be determined in consultation with City staff. The fair-share costs will be collected prior to approval of the project, and will be used to fund improvements as they are needed, based on individual building project traffic impact studies (see Mitigation Measure TRAN-1). The payment of the City's traffic impact fee may be considered a fair-share contribution, if the City's fee program can be demonstrated to effectively fund the total cost of the improvements identified above. If not, the fair share must be determined either through a new fee study or negotiation with the City. The ultimate agreement may include the requirement that the applicant fully fund certain cumulative improvements in exchange for later reimbursement as traffic impact fees are collected from other projects.	LTS
<u>TRAN-4:</u> The Project traffic would create the need for roadway widenings on various segments of East Second Street, Lake Herman Road, Bayshore Road, and Industrial Way.	S	<u>TRAN-4:</u> See Mitigation Measure TRAN-3.	LTS

TRAN-5: Future traffic volumes with the Project would require roads within the Project site to be wider in some locations than proposed in the Master Plan.

TRAN-6: The Project would contribute traffic to four freeway segments which are projected to exceed the available capacity in the future. On one of the segments (I-680 Northbound north of Lake Herman Road), the Project traffic causes the over-capacity condition.

TRAN-7: If off-street parking is not provided at levels consistent with the City of Benicia's zoning ordinance, parking demand could exceed off-street supply, resulting in on-street parking on streets that cannot accommodate parking due to truck access and circulation needs.

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TRAN-5: The Project applicant shall construct four travel lanes on the east-west roadway connecting Lake Herman Road and Industrial Way, with left turn pockets or a two-way left-turn lane, and four travel lanes on Industrial Way between East Second Street and the internal east-west roadway. The roadways should be designed to City of Benicia standards, with adequate corner radii, cul-de-sac radii, and lane widths to accommodate typical industrial park vehicles such as semi-trailers. The width that is required—five 12-foot travel lanes plus paved shoulder with curb/gutter—corresponds to the City's Major Arterial designation, with a 84-foot right-of-way and 70-foot curb-to-curb width.

TRAN-6a: The Project applicant shall incorporate the following design elements and services into the proposed development plans:

- Incentives for individual buildings to contain showers and lockers, and secure indoor bicycle lockers;
- Mandatory bicycle racks provided near each building complex; and
- Provision of transit stops with shelters at up to four locations throughout the Park, including one at the eastern retail area, two along Boulevard 'A' in the industrial area, and one along the Industrial Way extension.

TRAN-6b: The Project applicant shall pay a fair-share of future freeway improvements, as determined by Caltrans, the Solano Transportation Authority and the Metropolitan Transportation Commission.

TRAN-6c: The Project applicant shall contribute toward the initial costs of extending the Benicia Transit Pleasant Hill BART route to the Business Park, coordinating with the City and Benicia Transit. The service should not be instituted before the Project site is at least 50 percent built and occupied. The project applicant shall pay all capital costs and all operating costs for the first 2 years of service. Implementation of this mitigation measure will be coordinated with Benicia Transit. With these mitigation measures, this impact will remain significant and unavoidable, due to the extent of the over-capacity condition projected.

TRAN-7: The Project applicant shall require that future developers of individual parcels meet the parking zoning ordinance requirements for provision of off-street parking. On-street parking should not be incorporated into the design of Boulevard 'A', Industrial Way north of East Second Street, or Park Road north of East Second Street, but may be considered for the cul-de-sacs (if planned to serve businesses which don't require large truck access) and the internal retail area streets.

LTS

SU

LTS

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Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
<u>TRAN-8:</u> The Project site plan does not designate sidewalks on the primary traffic-serving streets, which may serve substantial pedestrian travel: Boulevard 'A', Industrial Way between East Second Street and Boulevard 'A', and Park Road north of East Second Street.	S	<u>TRAN-8:</u> The Project site plan shall indicate roadway widths to accommodate sidewalks on Boulevard 'A', Industrial Way between East Second Street and Boulevard 'A', and Park Road north of East Second Street. In addition, the Project applicant shall require individual project developers to consult with City staff regarding the provision of sidewalks on the industrial area cul-de-sacs, and particularly on retail area internal streets.	LTS
<u>TRAN-9:</u> The need for transit service to the Project site would require Benicia Transit to extend service beyond that currently provided.	S	<u>TRAN-9:</u> The Project applicant shall pay all capital costs and all operating costs for the first 2 years of Benicia Transit service to the Project site.	LTS
G. AIR QUALITY			
<u>AIR-1:</u> The proposed Project would result in long term emissions, including both mobile and stationary sources, that exceed the BAAQMD daily operational thresholds.	S	<u>AIR-1a:</u> Regional air quality will be improved through the implementation of the CAP and other air quality rules and regulations. Implementation of the BAAQMD recommended measures for reducing motor vehicle emissions from commercial, institutional, and industrial projects will help minimize the Project's long term air quality impacts. The following list of selective measures are recommended for the proposed Project: • Construct transit facilities such as bus turnouts/bus bulbs, benches, shelters, etc. • Implement carpool/vanpool program e.g., carpool ridematching for employees, assistance with vanpool formation, provision of vanpool vehicles, etc. • Provide preferential parking for carpool and vanpool vehicles. • Provide secure, weather-protected bicycle parking. • Provide safe, direct access for bicyclists to adjacent bicycle routes.	LTS

AIR-2: Depending on the level of construction conducted at any one time, PM₁₀ emissions due to dust generated could exceed the criteria level of 80 pounds per day. Gaseous emissions would add to the local pollutant loading.

S

AIR-2a: Prior to the issuance of any grading or building permits, the applicant shall submit a mitigation plan for dust impacts to the City Engineer for review and approval. No construction shall be conducted prior to acceptance of this plan. The plan shall specify construction mitigation measures that shall be incorporated in the project to comply with BAAQMD Regulation 6 that controls particulate matter and visible emissions. Measures such as the following shall be included: watering the site and equipment on a daily basis; covering haul trucks if cut or fill material are to be transported; and sweeping access and local streets.

LTS

AIR-2b: The "Basic Measures" and "Enhanced Measures" listed in Table IV.G-7 shall be implemented at the Project site. The "Optional Measures" listed in Table IV.G-7 may be implemented if further reduction of emissions is deemed necessary by the City.

AIR-2c: The applicant shall include the following measures to reduce emissions from construction equipment exhaust, where feasible: use alternative fueled construction equipment, minimize idling time (e.g., 5-minute maximum), maintain properly tuned equipment, and limit the hours of operation of heavy duty equipment and/or the amount of equipment in use.

AIR-2d: Like gaseous emissions, volatile organic emissions (VOE) associated with construction are not subject to significance criteria, but add substantially to the overall pollutant loading in the air basin. The applicant and/or contractor shall use emulsified asphalt or asphaltic cement where feasible. Rapid and medium cure cutback asphalt shall be avoided whenever possible.

AIR-2e: The applicant shall use low VOE paints, primers, and coatings, as well as precoated materials, where feasible.

AIR-2f: The BAAQMD's Enforcement Division should be consulted prior to commencing demolition of a building containing asbestos building materials. All demolition activities subject to the requirements of District Regulation 11, Rule 2: Hazardous Materials; Asbestos Demolition, Renovation and Manufacturing shall comply with the requirements of this rule.

H. VISUAL QUALITY

VIS-1: The water towers would be visible from several public viewpoints. These towers would be out of scale and character with adjacent open space.

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VIS-1a: The eastern water tank shall be placed on the south side of the hillside, facing the interior of the Project site (if possible while retaining adequate water pressure).

LTS

VIS-1b: Both water tanks shall be on graded pads set into the hillsides 30 feet so that the tops of the water tanks are minimally or not visible from Lake Herman Road.

VIS-1c: The proposed water tanks shall be painted an earth tone color, such as clay or sienna. The color shall be subject to approval by City staff prior to issuance of building permits for the tanks.

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Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
<i>VIS-1 continued</i>			
<u>VIS-2:</u> Views from Lake Herman Road would be affected by Project development.	S	<u>VIS-1d:</u> The water storage tanks shall be screened as much as possible by vegetation. Trees shall be planted to obscure at least 50 percent of the water tanks within 10 years of final Project buildout. <u>VIS-2a:</u> The applicant shall developed a detailed landscape plan. The landscape screening in this plan shall be designed to protect views from Lake Herman Road into the interior of the site. <u>VIS-2b:</u> Retention of some of the existing topography would help shield views of the proposed development from the views shown in Figure IV.H-5 and IV.H-6. Maintenance of the hilltop area located in Phases 8 and 10 of the proposed Project site would preserve these views. (Preservation of these hilltops has been included as part of the Mitigated Alternative shown in Chapter V and Figure V-1 of this EIR.)	LTS
<u>VIS-3:</u> The proposed Project would result in substantial terrain modifications.	S	<u>VIS-3:</u> Implementation of Mitigation Measures VIS-2a and VIS-2b would be required.	LTS
<u>VIS-4:</u> The proposed Project would impact views from several public roadways, including the I-680 Scenic Overlook and Industrial Way.	S	<u>VIS-4:</u> Final landscaping plans shall include provisions for street and site tree plantings that would be designed to obscure at least 50 percent of the new structures within 5 years of planting. The final landscaping plan shall be subject to approval by City staff prior to final Project approval. While this mitigation measure would help minimize visual impacts of the proposed Project from these public roadways which are already located within industrial areas.	LTS
<u>VIS-5:</u> The proposed prototypical site plans and Design Guidelines are inadequate to protect views and integrate the proposed development into the landscape.	S	<u>VIS-5:</u> Final Project designs shall comply with Design Guideline specifications for wall articulation and varied rooflines prior to final design review approval.	LTS
I. CULTURAL RESOURCES			
<u>CULT-1:</u> The possibility exists that undiscovered buried archaeological resources could be present on the Project site.	S	<u>CULT-1a:</u> Prior to the issuance of a grading permit, a qualified archaeologist should be retained to complete a Phase I – Assessment Survey of the Project site. Results of this survey, including subsequent recommendations, will be reviewed by the Project applicant and the City, and submitted to the Northwest Information Center for archival purposes. The Phase I report should include adequate mitigation measures to assure compliance with CEQA and local planning ordinances.	LTS

CULT-1b: If during Project excavation or construction archaeological resources that were not identified in the Phase I – Assessment Survey are encountered, the following mitigation measures shall be implemented:

- Activity in the vicinity of the suspected resources shall be immediately suspended and the City of Benicia personnel and a qualified archaeologist shall evaluate the find. Project personnel shall not alter any of the uncovered materials or their context.
- If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendent (MLD). With the permission of the landowner or his/her authorized representative, the descendent may inspect the site of the discovery. The descendent shall complete the inspection within 24 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.
- If archeological resources are discovered, and the City and the cultural resource consultant find that the resource is important based on the criteria provided in the *CEQA Guidelines* and criteria listed above, the City and Project developer, in consultation with a cultural resource expert, shall seek to avoid damaging effects on the resource wherever feasible.

If the City determines that avoidance is not feasible, a qualified cultural resource consultant shall prepare an excavation plan for mitigating the effect of the Project on the qualities that make the resource important. The mitigation plan shall be prepared in accordance with *CEQA Guidelines* and shall be submitted to the City for review and approval.

LTS = Less-than-Significant; S = Significant; SU = Significant Unavoidable.

Table II-1 *continued*

Environmental Impacts	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance With Mitigation
<u>CULT-2:</u> The project would include demolition of farm buildings that are 45 years old or older and that may be historically significant.	S	<u>CULT-2:</u> All potential historic resources at the project site should be identified during the Phase I Assessment Survey (recommended in Mitigation Measure CULT-1, above). A Primary Record Form¹ should be completed for any potential archeological resources and a Building Structure Object Form² should be completed for any standing structure. The results of the Phase I Assessment Survey and completed forms shall be presented in a report to include recommendations of the eligibility of structures at the site for listing in the California Register of Historic Properties. Other applicable mitigation measures to preserve the historic integrity of any potentially significant structures will be outlined. Demolition of existing buildings and structures shall not be permitted prior to completion of the cultural resources survey report. Any recommended mitigation measures outlined in the report to minimize impacts to structures that are determined to be eligible for listing in the California Register of Historic Properties (potentially including preservation or relocation of historic resources) shall be followed.	LTS
<u>CULT-3:</u> The possibility exists that buried paleontological resources could be present on the Project site.	S	<u>CULT-3:</u> If paleontological resources are encountered during Project construction activities, the following mitigation measures shall be implemented. • Activity in the vicinity of the suspected resource(s) shall be immediately suspended and the City and a qualified paleontological resource consultant shall be contacted to evaluate the find. Project personnel shall not alter any of the uncovered materials or their context. • If paleontological resources are discovered and the City and the paleontological resource consultant find that the resource is significant based on the criteria provided in the <i>CEQA Guidelines</i>, the City and Project developer, in consultation with a paleontological resource expert, shall seek to avoid damaging effects on the resource wherever feasible.	LTS

¹ California Department of Parks and Recreation Forms

² California Department of Parks and Recreation Forms

- If the City determines that avoidance is not feasible, a qualified paleontological resource consultant shall prepare a salvage plan for mitigating the effect of the Project on the qualities which make the resource important. The Project applicant, in consultation with a qualified paleontologist, shall complete a paleontological resource inventory, declaration, and mitigation plan in accordance with the *CEQA Guidelines* and submit it to the City for review and approval.

LTS = Less-than-Significant; S = Significant; SU = Significant Unavoidable.

Chapter III PROJECT DESCRIPTION

■ ■ ■

A. Project Objectives

The applicant has identified the following objectives for the proposed development of the Benicia Business Park:

- *To subdivide the Project area into 69 developable lots;*
- *To develop the site for industrial and commercial uses;*
- *To provide employment and revenue opportunities for Benicia;*
- *Provide an open space buffer for Lake Herman Road (four separate lots);*
- *To develop the site in a manner consistent with City General Plan and Zoning provisions; and*
- *To develop a Master Plan with adequate flexibility to allow a single large industrial facility or numerous smaller establishments to locate at the site.*

B. Project Location and Surroundings

The Benicia Business Park site is located in the northeastern portion of the City of Benicia in Solano County (see Figure III-1). Regional access is available via Interstate 680 which is located east of the Project site. Local access is available via East Second Street which connects with I-680 at the northeastern corner of the Project site and also connects with I-780 about 2.5 miles southwest. The site is also accessible from Lake Herman Road, which forms the northern boundary for much of the site. Downtown Benicia is located about 3 miles to the southwest.

The Project site consists of a total of 527.5 acres of undeveloped land bounded on the south and east by East Second Street. The western boundary is an irregular property line that generally parallels the alignments of West Channel Road and Industrial Way (Figure III-1). The northern property line is also irregular and is bounded in part by the City of Benicia Water Treatment Plant and Lake Herman Road. The site is traversed by Reservoir Road, a 20 foot wide paved road that

extends from East Second Street to Lake Herman Road. Surrounding land uses include industrial uses along Industrial Way and East Second Street, commercial uses at the I-680 and East Second Street interchange, utility uses associated with the water treatment plant, and undeveloped land.

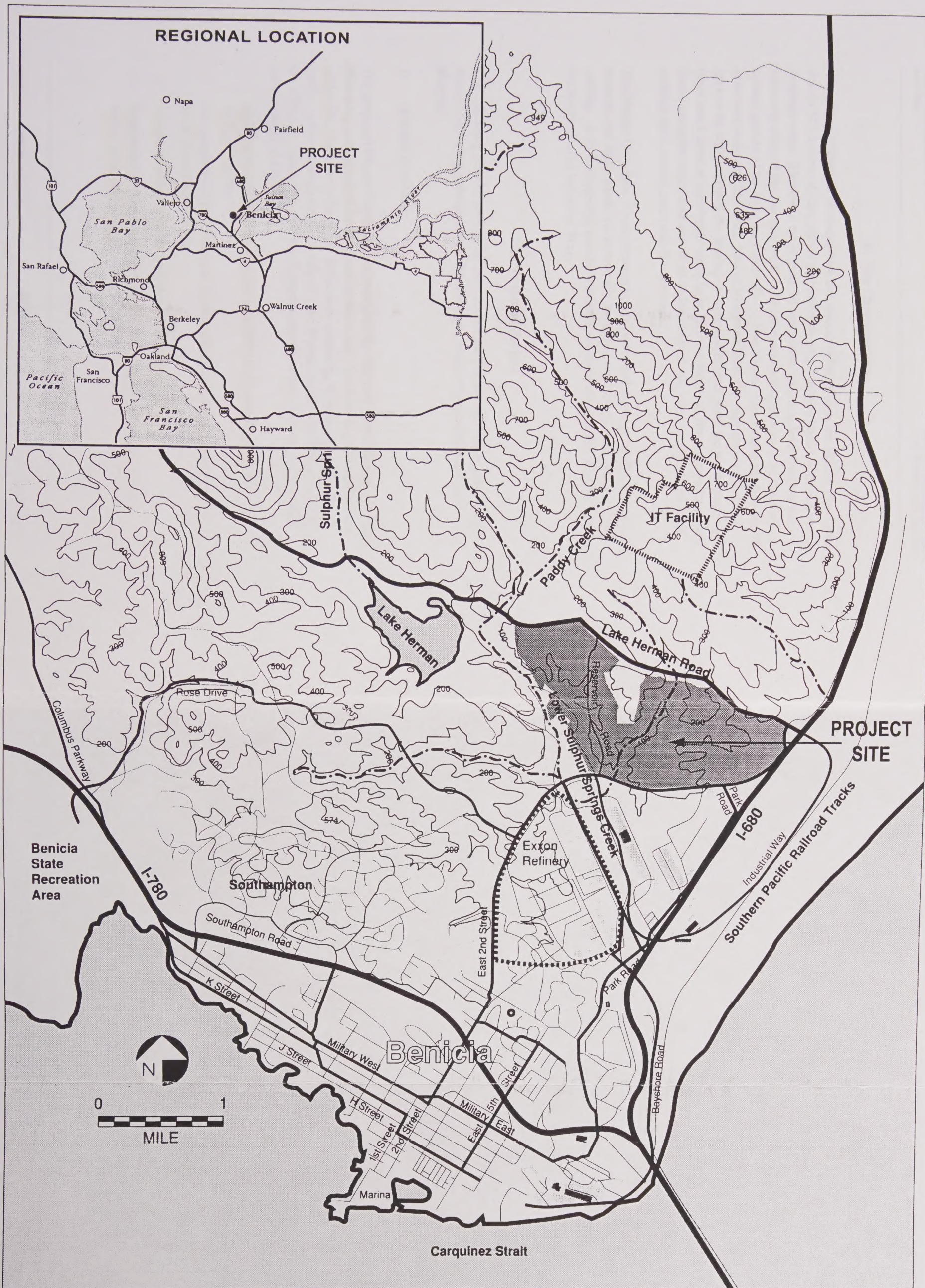
Undeveloped lands associated with the former International Technology Corporation (IT) Panoche Facility are located north of and adjacent to the Project site across Lake Herman Road. A variety of industrial uses are located to the south of the Project site across East Second Street and adjacent to the Project site to the west. Existing highway-oriented commercial development consisting of a combined gas station, convenience market and fast-food establishment is located to the east of the Project site at the intersection of Lake Herman Road and East Second Street. The Exxon refinery complex is located southeast of the site. The Suisun Marsh is about 1.5 miles east of the site, across I-680.

C. Summary of Site Planning

The Benicia Business Park site is owned by Albert D. Seeno Construction Company (Seeno). In 1981, an Environmental Impact Report (EIR) was prepared for a mixed-use development proposal that included the Project site. At that time, the Project site was part of unincorporated Solono County and annexation to the City of Benicia was evaluated in the EIR. In 1983 the Benicia City Council approved a land use amendment, rezoning, and annexation of the site and certified the EIR. The Local Agency Formation Commission (LAFCO) subsequently approved the annexation in 1985. In 1988, a site plan was developed for a business park at the site. That plan included 115 lots on 319 acres of the site. The proposed grading plan consisted of extensive cut and fill to create a benched building pad configuration. Prior to conducting environmental review for that development proposal, the applicant withdrew the application.

The current application has been developed to respond to various environmental concerns raised from earlier applications and interest in development of the property in the late 1980s and early 1990s. This application has been modified to address visual impacts and land use compatibility concerns.

The current application includes a Tentative Subdivision Map and a request for a Master Plan overlay zoning designation. A Master Plan is required by the City of Benicia General Plan for properties under common ownership which aggregate to more than 40 acres. The goals of the master plan process are to encourage the best and most effective use of properties and to allow the City to project the need for and to plan future public services and facilities.



Source: LSA Associates, Inc.

BENICIA BUSINESS PARK

D. Site Characteristics

The proposed Benicia Business Park site (herein referred to as the Master Plan Area) covers 527.5 acres of hilly terrain that includes six prominent knolls with intervening drainage ways. Elevations range from 30 feet above mean sea level (msl) in the eastern portion of the site near I-680 to 280 feet above msl on a knoll in the north-central portion of the site (see Figure III-2). The Master Plan Area is predominantly grassland with very few trees. East of Reservoir Road the vegetation consists of grass with willows along the drainage course that extends from the water treatment plant and a stand of eucalyptus along Lake Herman Road. A few scattered trees are found along the water courses. West of Reservoir Road, other vegetation includes orchard trees, shrubs, and ruderal vegetation.

The Master Plan Area, which contains several unnamed drainage swales, intermittent streams, and stock ponds has historically been, and is currently used, for livestock grazing. A 50-foot pipeline easement extends south-westward from the City's water treatment plant to Industrial Way.

E. Proposed Project

The following sections provide an overview of the Project and a description of plan features including proposed uses, densities, projected employment, and construction phasing.

1. Project Overview

The proposed Master Plan locates commercial development at the eastern end of the Plan Area and industrial development in the central, southern and western portions of the Plan Area. An open space buffer area consisting of primarily undeveloped land is proposed along the south side of Lake Herman Road. The Project applicant, the Albert D. Seeno Construction Company, proposes the following actions which are evaluated in this EIR:

- Subdivision of the 527.5-acre site into 69 lots (ranging in size from 1.36 acres to 11.35 acres);
- Development of 284.8 acres of limited industrial uses and development of 45 acres of commercial uses;
- Retention of four lots for open space (totaling 169.8 acres);
- Installation of necessary infrastructure including 27.9 acres of roadways, water, sewer and utilities;

- Installation of two 1-million-gallon water tanks that would provide water supply for the proposed development.

A Master Plan showing the proposed subdivision is shown in Figure III-2.

The site is designated for limited industrial and commercial uses in the General Plan (City of Benicia, June 1998). Current zoning designation for the approximately 45 acres of land in the eastern portion of the Master Plan is General Commercial (CG). The remainder of the site is designated for Limited Industrial (IL). The City has initiated rezoning of a 8.8-acre portion of the Master Plan Area (adjacent to, and west of, the existing commercial land) from IL to CG.

Development of the Master Plan would require extensive grading to provide level lots and to construct the proposed roadway system. The major portion of grading would occur on the western, southern, and eastern portions of the site. Two prominent hills contained in Lot A (see Figure III-2) in the northern portion of the site would be retained in a relatively natural condition. This area, about 136 acres, would generally be maintained as open space (see Figure III-2). Other areas of open space would include Lots B (15.7 acres); C (15.3 acres), and D (2.7 acres), as shown in Figure III-3.

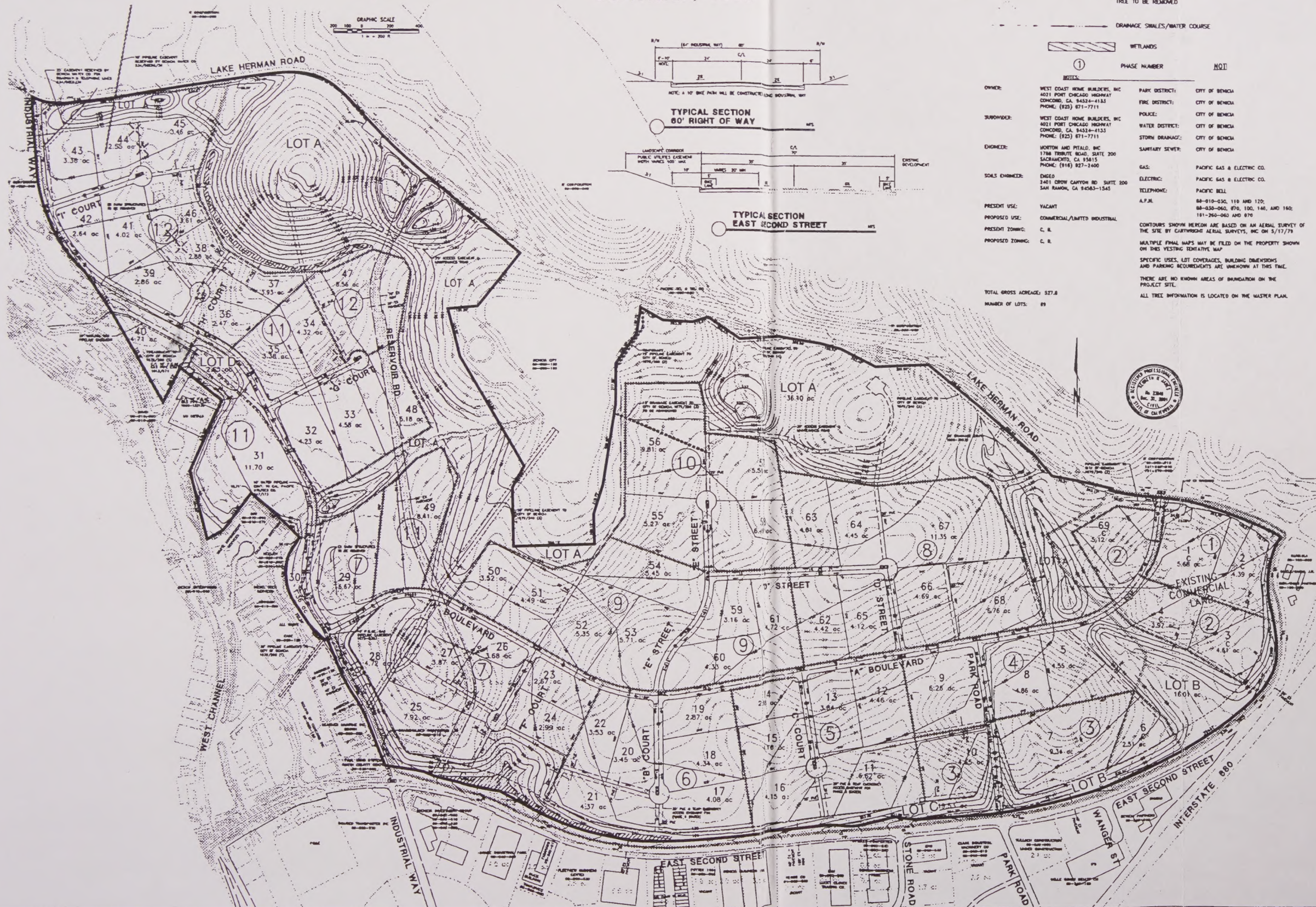
2. Plan Features

The proposed land uses within the Master Plan area would be predominantly industrial uses with some commercial uses and open space. The location of proposed future land uses are shown in Figure III-3. Proposed development intensities by phase and lot for those areas of the site proposed for industrial and commercial use are listed in Table III-1. Specific plan features are described below.

a. Limited Industrial Development. A total of 284.8 acres of limited industrial uses would be developed at the site in an area designated as Limited Industrial (IL) in the City's General Plan. Adoption of the Master Plan would result in construction of approximately 4,094,000 square feet of industrial buildings with an average floor area ratio (FAR¹) of .33. In IL areas, the City's General Plan permits wholesale, distribution, and storage facilities; research and development facilities; and related industrial and commercial services. Additional uses, including auto sales and services, mini-storage, eating and drinking establishments, and churches may be

¹ Floor area ratio refers to the ratio of square footage of building area to land area. For example, an FAR of 0.5 means that for every acre of land (43,560 square feet), no more than 21,780 square feet (one half of 1 acre) of development would be allowed (independent of the height of structures).

VESTING TENTATIVE MAP
BENICIA BUSINESS PARK
 CITY OF BENICIA, CA
 SEPTEMBER, 1998



UTILITY LEGEND

EXISTING PROPOSED DESCRIPTION

CL SLOPE
 CL GRADE
 TREE TO BE REMOVED
 DRAINAGE SWALES/WATER COURSE

WETLANDS
 PHASE NUMBER
 NOT

OWNER: WEST COAST HOME BUILDERS, INC.
 4021 PORT CHICAGO HIGHWAY
 CONCORD, CA 94524-4133
 PHONE: (925) 871-7711
 SUBOWNER: WEST COAST HOME BUILDERS, INC.
 4021 PORT CHICAGO HIGHWAY
 CONCORD, CA 94524-4133
 PHONE: (925) 871-7711
 ENGINEER: MORTON AND PITALO, INC.
 1700 TIMBER ROAD, SUITE 200
 SACRAMENTO, CA 95815
 PHONE: (916) 927-2400
 SOILS ENGINEER: CHSLO
 2401 CROWN CANYON RD. SUITE 200
 SAN RAMON, CA 94583-1545
 PRESENT USE: VACANT
 PROPOSED USE: COMMERCIAL/LIMITED INDUSTRIAL
 PRESENT ZONING: C. R.
 PROPOSED ZONING: C. R.

TOTAL GROSS ACREAGE: 527.8
 NUMBER OF LOTS: 89



BENICIA
 BUSINESS
 PARK

Figure III-2
 Master Plan
 Tentative Map

VESTING TENTATIVE MAP
BENICIA BUSINESS PARK
 CITY OF BENICIA, CA
 SEPTEMBER, 1998

UTILITY LEGEND

EXISTING	PROPOSED	DESCRIPTION
		CL. SLOPE
		CL. GRADE
		TREE TO BE REMOVED
		DRAINAGE SWALES/WATER COURSE
		WETLANDS

NOTES:

OWNER:	WEST COAST HOME BUILDERS, INC. 4021 PORT CHICAGO HIGHWAY CONCORD, CA 94524-4133 PHONE: (925) 871-7711	PARK DISTRICT:	CITY OF BENICIA
SURVINDER:	WEST COAST HOME BUILDERS, INC. 4021 PORT CHICAGO HIGHWAY CONCORD, CA 94524-4133 PHONE: (925) 871-7711	FIRE DISTRICT:	CITY OF BENICIA
ENGINEER:	MORTON AND PITALO, INC. 1700 TRINITY ROAD, SUITE 200 SACRAMENTO, CA 95815 PHONE: (916) 927-2400	POLICE:	CITY OF BENICIA
SOILS ENGINEER:	ENGED 2401 CROW CANYON RD. SUITE 200 SAN RAMON, CA 94583-1545	WATER DISTRICT:	CITY OF BENICIA
PRESIDENT USE:	VACANT	STORM DRAINAGE:	CITY OF BENICIA
PROPOSED USE:	COMMERCIAL/LIMITED INDUSTRIAL	SANITARY SEWER:	CITY OF BENICIA
PRESIDENT ZONING:	C. B.	GAS:	PACIFIC GAS & ELECTRIC CO.
PROPOSED ZONING:	C. B.	ELECTRIC:	PACIFIC GAS & ELECTRIC CO.
		TELEPHONE:	PACIFIC BELL

TOTAL GROSS ACREAGE: 527.8
 NUMBER OF LOTS: 89



CONTOURS SHOWN HEREON ARE BASED ON AN AERIAL SURVEY OF THE SITE BY CAPTIVANT AERIAL SURVEYS, INC. ON 5/11/79.
 MULTIPLE FINAL MAPS MAY BE FILED ON THE PROPERTY SHOWN ON THIS VESTING TENTATIVE MAP.
 SPECIFIC USES, LOT COVERAGES, BUILDING DIMENSIONS AND PARKING REQUIREMENTS ARE UNKNOWN AT THIS TIME.
 THERE ARE NO KNOWN AREAS OF CONTAMINATION ON THE PROJECT SITE.
 ALL TREE INFORMATION IS LOCATED ON THE MASTER PLAN.

**BENICIA
 BUSINESS
 PARK**

LEGEND

	Commercial
	Limited Industrial
	Open Space

Figure III-3
 Proposed Land Uses

Table III-1
BENICIA BUSINESS PARK PROPOSED DEVELOPMENT

Phase ^a	Lots ^b	Industrial Acres	Commercial Acres	Industrial ^c Est. Bldg. (sq. ft.)	Commercial ^d Est. Bldg. (sq. ft.)
1	1&2		10.0		108,900
2	3,4&69		13.7		149,190
3	6&7		11.9		129,590
3	10	4.7		67,560	
4	5&8		9.4		102,370
4	9	6.3		90,560	
5	11-16	26.2		376,620	
6	17-22	22.6		324,870	
7	23-30	33.9		487,310	
8	62-68	40.4		580,750	
9	50-54&59-61	36.7		527,560	
10	55-58	27.1		389,560	
11	31-35, 48&49	41.9		602,310	
12	36-47	45.0		646,870	
Total		284.8	45.0	4,094,000	490,000

^a Phase as proposed by the applicant

^b Refer to Figure III-2 for lot locations

^c Assumes a floor area ratio (FAR) for Light Industrial Land (I) of .33 FAR

^d Assumes a floor area ratio (FAR) for Commercial Land (C) of .25 FAR

Note: These FARs are estimates and are intended to be an average. Some areas of this Project may have a greater FAR and some areas may have less.

Source: Seeno, 1999.

allowed with approval of a Use Permit. Although specific site plans for industrial development are not proposed as part of the Master Plan, several possible site plans for industrial lot development are shown in Figure III-4. City development standards are presented in Table III-2.

b. Commercial Development. The Master Plan includes construction of commercial uses on 45.0 acres of land located near the intersection of Lake Herman Road and East Second Street. The Master Plan would result in construction of approximately 490,000 square feet of commercial buildings with an average FAR of .25 on lots 1 through 8 and lot 69. These uses are likely to be similar to existing types of nearby commercial facilities that would serve existing and proposed industrial uses and would be accessible from I-680. A likely development scenario for this area is shown in Figure III-5. Development standards are presented in Table III-3.

Table III-2
DEVELOPMENT STANDARDS FOR INDUSTRIAL AREAS
(Limited Industrial District)

Feature	Standard
Minimum lot size	20,000 square feet
Minimum lot width	100 feet
Minimum setbacks	10 feet
Maximum height	50 feet
Maximum lot coverage	50%
Maximum FAR	0.8

Source: City of Benicia, 1999.

Table III-3
DEVELOPMENT STANDARDS FOR
COMMERCIAL AREAS

Feature	Standard
Minimum lot size	7,500 square feet
Minimum lot width	60 feet
Minimum setbacks	10 feet
Maximum height	40 feet
Maximum lot coverage	75%

Source: City of Benicia, 1999.

Uses in the commercial area may include all CG permitted uses, and are likely to include uses that serve the industrial park, such as: business & professional offices, public safety facilities (fire station), restaurant/food services, conference and meeting facilities, banks/savings and loans, maintenance and repair services, research and development services, and service station.

c. Infrastructure. New infrastructure to serve the Benicia Business Park project would include roads, water lines, wastewater lines, and other utilities. Parking would be provided on each lot in accordance with the zoning requirements for land uses and development area. Utilities serving new development would be constructed underground within individual lots and would connect to utilities within road rights-of-way.

The proposed Master Plan includes the extension of Industrial Way, in the western portion of the Project, from East Second Street north to Lake Herman Road. This

BENICIA BUSINESS PARK

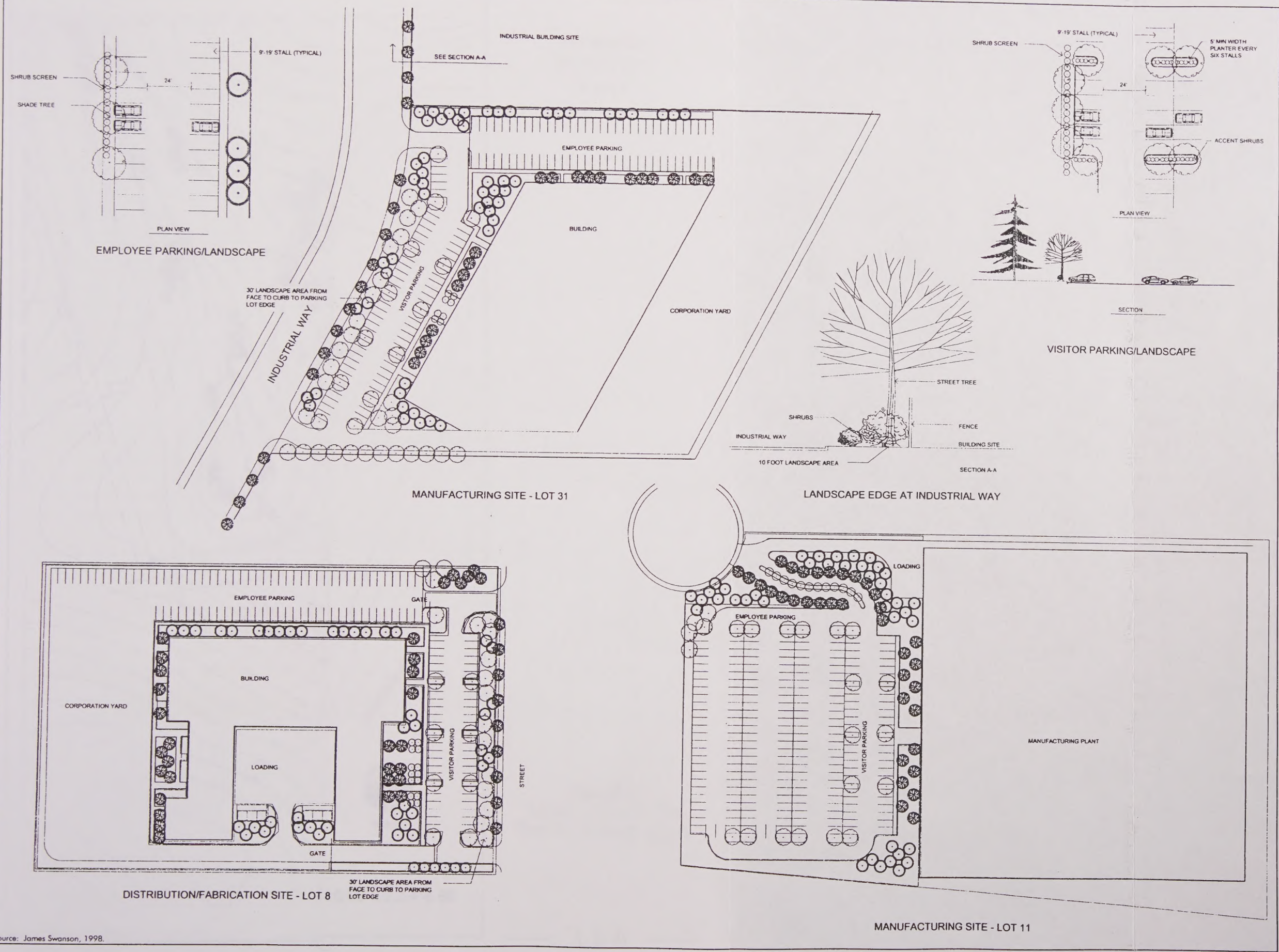


Figure III-4
Anticipated Typical Site
Plans for Industrial Lots

Source: James Swanson, 1998.

BENICIA
BUSINESS
PARK



Source: James Swanson, 1998.

Figure III-5
Typical Anticipated Site
Plans for Commercial Lots

new roadway would replace the existing Reservoir Road. Access to the Project site would also be provided from Lake Herman Road along a new street labeled "A" Boulevard in the Master Plan, which would traverse the Project site in an east/west direction and would connect with Industrial Way (Figure III-2). A connector street, Park Road, would connect East Second Street with the proposed "A" Boulevard in the southeastern portion of the site. Internal roads and cul-de-sacs would serve individual lots (Figure III-2). Access to the Benicia Business Park from the east would be from I-680 via Lake Herman Road and the proposed "A" Boulevard. Access from the west would be provided via East Second Street and Industrial Way. Access from the north would be from I-680 via Lake Herman Road and the proposed "A" Boulevard. Secondary access would be provided via West Channel, which would be improved and connected to Industrial Way. East Second Street would be reconstructed from Industrial Way to Lake Herman Road and would be 60 feet wide with 5-foot wide bike paths on each side of the road. Industrial Way would be 48 feet wide and would include one 10-foot wide off-street bike path adjacent to the roadway. The slope along Second Street would be about 30 percent and would average 30 feet in height.

Water would be provided to the Project site by two new tank reservoirs on a separate zone system from the City of Benicia. Twelve-inch water lines would be installed throughout the Project site (Figure III-6). Two water storage tanks, 100 feet in diameter and 30 feet high (refer to Figure III-8) would be located in the higher elevation areas near Lake Herman Road. The Project would be connected to existing municipal sewage mains in East Second Street. An 8-inch sewer line would be installed in roadways to serve future uses at the site (Figure III-6).

Runoff from street drainage would be collected in 36-inch drain pipes that would be constructed in streets and connected with existing storm drainage facilities in East Second Street (Figure III-7). This water is ultimately discharged to Suisun Bay, located about 1.5 miles southeast of the site. The stormwater drainage plan also includes some drainage to wetland and pond areas within the Master Plan area. The primary function of these areas is to provide on-site mitigation for wetlands but they also would serve as stormwater treatment and detention facilities.

d. Open Space and Landscaping. A total of 169.8 acres of undeveloped land consisting of Lots A, B, C, and D is included in the Master Plan (Figure III-3). The northern portion of the site, the 136-acre Lot A, would include wetland mitigation areas with new landscaping and would provide an open space and landscape buffer from Lake Herman Road. Lots B, C, and D, at various locations adjoining East Second Street, would be undeveloped, would be used for drainage and wetland

mitigation areas, and would remain as open space. Nine wetland mitigation areas have been identified and are shown in Figure III-8. These areas would be planted and managed for wetland habitat value and could include ponds, riparian vegetation, and other hydrologic and vegetative features typical of wetlands.

Several landscape berms or land "bridges"² are proposed to protect views from various public viewing points, particularly from Lake Herman Road. Where areas proposed as open space would be disturbed by grading activities, the applicant proposes to revegetate such areas with native grasses and native shrubs. Existing trees and other vegetation would be preserved where possible (Figure III-8).

Street trees would be planted along the proposed "A" Boulevard. The landscape plan for the Project site also includes some trees along East Second Street, Park Street, Industrial Way and portions of Lake Herman Road. A list of proposed plant materials is provided in Table III-4.

e. Grading. An estimated 5 to 8 million cubic yards of soil would be excavated from the site (Figure III-9). Cuts would be up to 100 feet deep where hills are removed and fills, mostly in swales, would be 30 to 50 feet deep. Maximum slopes in the developable portion of the site would be 3 percent.³ A 30 percent maximum slope would be constructed along East Second Street and would consist of some cut and some fill slopes. Grading would be balanced on site. However, some imported fill material would be required for utility backfill, roadbed and similar uses.

f. Projected Employment. About 4,094,000 square feet of new industrial uses and 490,000 square feet of commercial use would be constructed within the Master Plan area, as shown in Table III-1. Based on demographic and employment projections contained in the Economic and Fiscal Background Report for the Benicia General Plan, these land uses would generate an estimated 8,223 employees.⁴ The Master Plan represents about half of the total commercial development and employment growth and about one third of the industrial employment projected in the City's General Plan.

² A land bridge is an artificial landform that consists of fill material placed between ridges or saddles. "Land bridges" are planned for this Project to screen views of developed areas.

³ A 3 percent slope is equivalent to a 30 horizontal to 1 vertical (30:1) slope. A 33 percent slope is equivalent to a 3:1 slope or 18.4 degrees.

⁴ 6,823 for the industrial uses and 1,400 for the commercial uses.

UTILITY LEGEND

PAINTING	PROPOSED	DESCRIPTION
		SANITARY SEWER PIPE & SIZE
		DOMESTIC WATER PIPE & SIZE BORROW FROM PROPOSED WATER SERVICE LINES
		DOMESTIC WATER PIPE & SIZE BORROW FROM EXISTING WATERLINES
		RAW WATER PIPE & SIZE
		WINDHOLE
		VALVE
		FIRE HYDRANT
		UTILITY POLE



Figure III-6
Proposed Water
and Sewer

SEPTEMBER, 1998

WATER

DRAINAGE

GRAPHIC SCALE
1" = 200'

LAKE HERMAN ROAD

INDUSTRIAL WAY

WEST CHANNEL

RESERVOIR RD.

LAKE HERMAN ROAD

EAST SECOND STREET

WINGER ST

INTERSTATE 880

PARK ROAD

STONE ROAD

LOT A

LOT B

LOT C

LOT D

LOT E

LOT F

LOT G

LOT H

LOT I

LOT J

LOT K

LOT L

LOT M

LOT N

LOT O

LOT P

LOT Q

LOT R

LOT S

LOT T

LOT U

LOT V

LOT W

LOT X

LOT Y

LOT Z

LOT AA

LOT AB

LOT AC

LOT AD

LOT AE

LOT AF

LOT AG

LOT AH

LOT AI

LOT AJ

LOT AK

LOT AL

LOT AM

LOT AN

LOT AO

LOT AP

LOT AQ

LOT AR

LOT AS

LOT AT

LOT AU

LOT AV

LOT AW

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LOT AY

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LOT IN

LOT IO

LOT IP

LOT IQ

LOT IR

LOT IS

LOT IT

LOT IU

LOT IV

LOT IW

LOT IX

LOT IY

LOT IZ

LOT JA

LOT JB

LOT JC

LOT JD

LOT JE

LOT JF

LOT JG

LOT JH

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LOT RA

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LOT

Figure III-7
Proposed
Drainage Plan

BENICIA BUSINESS PARK



Figure III-8
Planned Wetland
Restoration Areas and
Water Tank Locations

VESTING TENTATIVE MAP
BENICIA BUSINESS PARK
 CITY OF BENICIA, CA
 SEPTEMBER, 1998

UTILITY LEGEND

EXISTING	PROPOSED	DESCRIPTION
		CL SLOPE
		CL GRADE
		TREE TO BE REMOVED
		DRAINAGE SWALES/WATER COURSE
		WETLANDS

NOTES

OWNER:	WEST COAST HOME BUILDERS, INC. 4021 PORT CHICAGO HIGHWAY CONCORD, CA 94520-4133 PHONE: (925) 871-7711	PARK DISTRICT:	CITY OF BENICIA
SUBDIVIDER:	WEST COAST HOME BUILDERS, INC. 4021 PORT CHICAGO HIGHWAY CONCORD, CA 94520-4133 PHONE: (925) 871-7711	FIRE DISTRICT:	CITY OF BENICIA
ENGINEER:	MORTON AND PITALO, INC. 1704 TIMBER ROAD, SUITE 200 SACRAMENTO, CA 95815 PHONE: (916) 827-2400	POLICE:	CITY OF BENICIA
SOILS ENGINEER:	DWELD 2401 ECHO CANYON RD. SUITE 200 SAN RAMON, CA 94583-1545	WATER DISTRICT:	CITY OF BENICIA
PRESIDENT USE:	VACANT	STORM DRAINAGE:	CITY OF BENICIA
PROPOSED USE:	COMMERCIAL/LIMITED INDUSTRIAL	SANITARY SEWER:	CITY OF BENICIA
PRESIDENT ZONING:	C. R.	GAS:	PACIFIC GAS & ELECTRIC CO.
PROPOSED ZONING:	C. R.	ELECTRIC:	PACIFIC GAS & ELECTRIC CO.
		TELEPHONE:	PACIFIC BELL
		A.P.N.	88-818-030, 110 AND 120; 88-038-040, 070, 100, 140, AND 160; 181-260-060 AND 070

TOTAL GROSS ACRES: 527.8
 NUMBER OF LOTS: 89

LEGEND

	Area of Cut
	Area of Fill

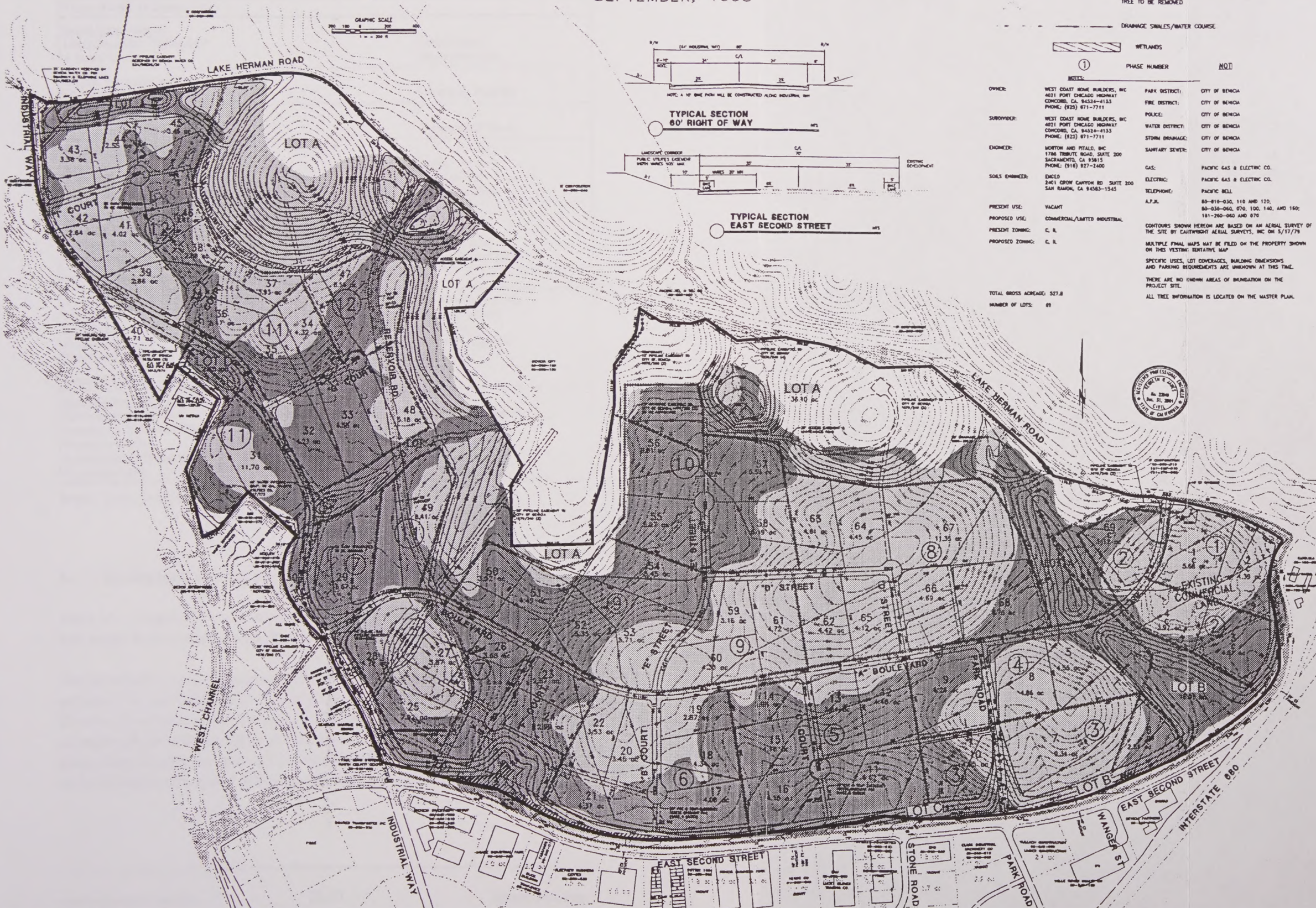


Figure III-9
 Grading Plan

**Table III-4
PLANT MATERIALS LIST**

Trees (To Be 15 Gallon Size)	
<u>Small Trees such as:</u> Lagerstroemia l. "Cherokee" Arbutus Unedo	Crepe Myrtle Strawberry Tree
<u>Accent Trees such as:</u> Populus n. "Italica"	Lombardy Popular
<u>Flowering Trees such as:</u> Crataegus phaenopyrum	Washington Thorn
<u>Shade Trees such as:</u> Quercus agrifolia Platanus a. "Bloodgood" Pyrus c. "Aristocrat"	Coast Live Oak London Plane Tree Aristocrat Pear
<u>Conifer Trees such as:</u> Pinus halepensis Cedrus deodara Pinus canariensis	Aleppo Pine Deodar Cedar Canary Island Pine
Flowering Shrubs (Such as the Following)	
Arctostaphylos d. "Howard McMinn" Raphiolepis l. "Jack Evans" Lagerstroemia indica Diets bicolor Escallonia terri	McMinn Manzanita India Hawthorn Crape Myrtle Fortnight Daylily Escallonia
Ground Covers	
<u>Groundcovers such as:</u> Cotoneaster "Low Fast" Lantana m. "Lavender Swirl" Juniperus conferta Rosmarinus o. "Prostrata" Coprosma kirkii	Prostrate Cotoneaster Lavender Lantana Shore Juniper Prostrate Rosemary Kirk's Coprosma

Source: James Swanson, 1998.

3. Development Phasing and Infrastructure Improvement

Table III-1, Proposed Development, provides a list of proposed uses and densities that would be developed in each phase of the Project.

Site preparation and development would occur in 12 phases, beginning in the eastern portion of the site (Figure III-10). The Project site is expected to be built out within 20 years of the beginning of construction. Grading, site preparation and installation of major infrastructure would be limited to those roads and utilities necessary for the phase under construction and cumulative development to date. The first four phases of the Project would consist of development of the proposed commercial area.

Phases five through seven would include construction of industrial uses south of the proposed "A" Boulevard. Phases eight through ten would include development of the hillside north of the proposed "A" Boulevard. The last two phases of the Project would include development of lots along Industrial Way. Main streets would not be connected as through streets until the final phase of development adjacent to the road. Therefore, "A" Boulevard is proposed as a cul-de-sac until phase 7. Periodic traffic surveys may verify the need for and recommend street improvement needs ahead of the proposed phasing plan.

Construction of the proposed project would require on-site and off-site water and wastewater improvements. These pipelines, pumps, and water tanks are proposed as part of the project and would be installed by the applicant according to the needs of each phase of development. The proposed location and timing of each water and wastewater facility is identified in Table III-5. The Public Works Department has reviewed the proposed wastewater generation from the proposed project and has determined that existing facilities and treatment capacity can accommodate this project (Table III-6).

F. Required Permits and Approvals

The proposed project would require local, state, and federal permits and approvals prior to construction. These are summarized below:

1. Local Agencies

a. City of Benicia.

- Vesting Tentative and Final Subdivision Map Approvals
- Approval of Improvement Plans for Utilities
- Design Review Approval
- Grading Plans and Permits
- Building Permits

b. Benicia Fire Department.

- Review of plans and approval prior to issuing building permits

VESTING TENTATIVE MAP
BENICIA BUSINESS PARK
 CITY OF BENICIA, CA
 SEPTEMBER, 1998

UTILITY LEGEND

EXISTING	PROPOSED	DESCRIPTION
		CL SLOPE
		CL GRADE
		TREE TO BE REMOVED
		DRAINAGE SWALES/WATER COURSE
		WETLANDS
		PHASE NUMBER
		NOT

OWNER: WEST COAST HOME BUILDERS, INC.
 4021 PORT CHICAGO HIGHWAY
 CONCORD, CA 94524-4133
 PHONE: (925) 871-7711

SUBDIVIDER: WEST COAST HOME BUILDERS, INC.
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ENGINEER: MORTON AND PITALO, INC.
 1748 THURTELL ROAD, SUITE 200
 SACRAMENTO, CA 95815
 PHONE: (916) 827-2400

SOILS ENGINEER: DUGED
 2401 CROW CANYON RD. SUITE 200
 SAN RAMON, CA 94583-1545

PRESORT USE: VACANT
 PROPOSED USE: COMMERCIAL/LIMITED INDUSTRIAL
 PRESENT ZONING: C. R.
 PROPOSED ZONING: C. R.

PARK DISTRICT: CITY OF BENICIA
 FIRE DISTRICT: CITY OF BENICIA
 POLICE: CITY OF BENICIA
 WATER DISTRICT: CITY OF BENICIA
 STORM DRAINAGE: CITY OF BENICIA
 SANITARY SEWER: CITY OF BENICIA

GAS: PACIFIC GAS & ELECTRIC CO.
 ELECTRIC: PACIFIC GAS & ELECTRIC CO.
 TELEPHONE: PACIFIC BELL
 A.P.S. 80-819-030, 110 AND 120;
 80-030-040, 070, 100, 140, AND 160;
 181-290-060 AND 070

CONTOURS SHOWN HEREON ARE BASED ON AN AERIAL SURVEY OF THE SITE BY CARTWRIGHT AERIAL SURVEYS, INC. ON 3/17/79.

MULTIPLE FINAL MAPS MAY BE FILED ON THE PROPERTY SHOWN ON THIS VESTING TENTATIVE MAP.

SPECIFIC USES, LOT COVERAGES, BUILDING DIMENSIONS AND PARKING REQUIREMENTS ARE UNKNOWN AT THIS TIME.

THERE ARE NO KNOWN AREAS OF CONTAMINATION ON THE PROJECT SITE.

ALL TREE INFORMATION IS LOCATED ON THE MASTER PLAN.

TOTAL GROSS ACREAGE: 327.8
 NUMBER OF LOTS: 89

BENICIA
 BUSINESS
 PARK

LEGEND

1 Development Phase

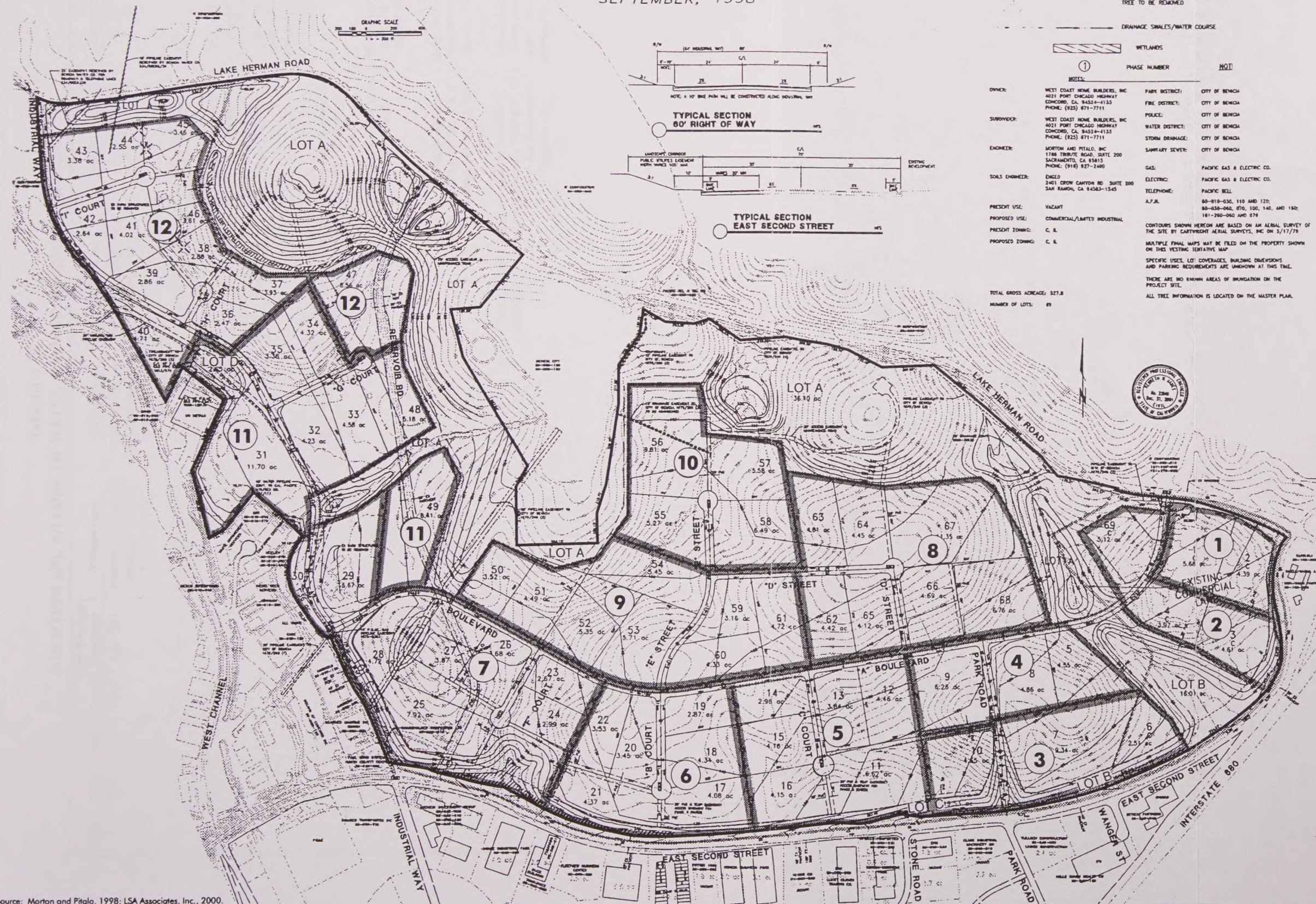


Figure III-10
 Phasing

Table III-5
LOCATION AND PHASING OF WATER AND WASTEWATER FACILITIES

Phase	Lots	Acres	Type*	Est. Develop- ment Date	Off-Site Water	On-Site Water	Off-Site Sewer	On-Site Sewer	Comment/Notes
1	1 & 2	10	COM	2000-2001	Potential upsize portions existing 10" line to 12" line for fire flow	Extend 12" line from Carl's/Shell along E. 2 nd & Lake Herman frontages	None: ties into existing 8" line in E. 2 nd Street	New 8" line	—
2	3, 4, 69	13.7	COM	2000-2001	Served by Phase 1 construction	Served by Phase 1 construction	None: ties into existing 8" line in E. 2 nd Street	Served by Phase 1	—
3	6 & 7	11.9	COM	2000-2001	—	Served by existing system in E. 2 nd Street	None: Lot 6 served by Phase 1 construction; Lot 7 served by existing 12" line in Park Road	None: Lot 6 served by Phase 1 construction; Lot 7 served by existing 12" line in Park Road	System Upgrade Analysis for Park/Industrial Life Station - To include: baseline study & off-site gravity & force mains
3	10	4.65	IND	2002-2003	—	Served by existing system in E. 2 nd Street	None: Lot 10 served by existing 12" line in Park Road	None: Lot 10 served by existing 12" line in Park Road	—
4	5 & 8	9.4	COM	2003-2004	—	—	Construct upgrades identified in Phase 3 flow test	Service provided by Phase 3 construction	Begin planning and design for Water Storage Tank #1
4	9	6.3	IND	2003-2004	—	—	—	—	—
5	11, 12, 13, 14, 15, 16	26.2	IND	2005-2006	Construct Storage Tank #1 and related pumping facilities	—	—	Service provided by existing 10" line in E. 2 nd Street that flows to Stone Road	Update prior studies to determine need for pumping/force main improvements
6	17, 18, 19, 20, 21, 22	22.6	IND	2006-2007	—	—	Construct improvements identified in Phase 5 update	Service provided by existing 10" line in E. 2 nd Street that flows west to Industrial Way	Analyze downstream sewer system for capacity and identify if improvements required

Phase	Lots	Acres	Type*	Est. Development Date	Off-Site Water	On-Site Water	Off-Site Sewer	On-Site Sewer	Comment/Notes
7	23, 24, 25, 26, 27, 28, 29, 30	34	IND	2007-2008	—	—	Construct improvements identified in Phase 6 analysis	—	Begin planning and design for Water Storage Tank #2 as required
8	62, 63, 64, 65, 66, 67, 68	40.4	IND	2008-2009	—	Extend westward in "D" Street	—	Extend system in "D" Street from "A" Blvd.	Monitor if Water Storage Tank #2 required
9	50, 51, 52, 53, 54, 59, 60, 61	36.7	IND	2010-2011	—	Extend system in "D" and "E" Streets	—	Extend system in "D" and "E" Streets	Monitor if Water Storage Tank #2 required
10	55, 56, 57, 58	27.2	IND	2011-2012	—	Extend system in "E" Street	—	Extend system in "E" Street	Monitor if Water Storage Tank #2 required
11	31, 32, 33, 34, 35, 48, 49	41.8	IND	2013-2014	Construct Storage Tank #2 if required	Extend system in Industrial Way & "G" Court	Construct improvements to downstream gravity & pumping facilities if required	Extend system in Industrial Way & "G" Court	Update sewer system study
12	36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47	45.1	IND	2014-2015	Construct Storage Tank #2 if not done in Phase 11	Extend system in Industrial Way, and "I" and "H" Courts; Construct loop connection to NE corner Lot 37	—	Extend system in Industrial Way, "H" and "I" Courts	

- NOTES: 1. Ultimate on-site water/sewer improvements are shown on vesting tentative map.
2. See Phasing Plan Report for improvements description for each phase.
3. Fire flow storage analysis shall be required for each project application.
4. On-site water facilities shall be constructed as a looped system.

* COM = Commercial; IND = Industrial

Source: City of Benicia, 2000.

**TABLE III-6
ESTIMATE PROJECT DEMAND FOR SEWER CAPACITY**

Estimated Sewer Capacity and Impact (per Water & Sewer Plan filed with City)	MGD Capacity	MGD from Project	
At Industrial Way	1.60	1.20	
At Park Road	1.00	0.26	
At East Second Street	0.60 1.10	0.18	in 8" line in 10" line
Park Road/Industrial Way Sewer Lift Station	New wet-well + 2 additional pumps @ Phase 11 required for BBP ultimate build-out per 4/1/99 Design Memorandum by Bissell & Karn, Inc.		

Source: City of Benicia, 2000

2. State Agencies

a. California Department of Fish and Game (CDFG).

- Streambed Alteration Agreement (for proposed water line)
- Review and comment on wetlands impacts and sensitive species

b. California Regional Water Quality Control Board (RWQCB).

- National Pollution Discharge Elimination System (NPDES) Permit
- Section 404 Permit (401)

3. Federal Agencies

a. U.S. Army Corps of Engineers (Corps).

- Section 404 permit for fill activities

b. United States Fish and Wildlife Service (USFWS).

- Consultation with USFWS and CDFG regarding fish and wildlife resource impacts

**TABLE 3-11
 ESTIMATE SUMMARY OF PROJECT COSTS**

Category	Item	Unit	Quantity	Unit Cost	Total Cost
Land	Acres	Sq. Ft.	100,000	\$1.00	\$100,000.00
	Improvements	Sq. Ft.	100,000	\$1.00	\$100,000.00
Construction	Foundation	Sq. Ft.	100,000	\$1.00	\$100,000.00
	Structure	Sq. Ft.	100,000	\$1.00	\$100,000.00
Equipment	Trucks	Trucks	10	\$10,000.00	\$100,000.00
	Other	Other	10	\$10,000.00	\$100,000.00
Professional Fees	Engineering	Hours	10,000	\$10.00	\$100,000.00
	Architecture	Hours	10,000	\$10.00	\$100,000.00
Other	Permits	Permits	10	\$10,000.00	\$100,000.00
	Insurance	Insurance	10	\$10,000.00	\$100,000.00

Chapter IV

SETTING, IMPACTS, AND MITIGATION MEASURES

■ ■ ■

This chapter identifies significant adverse impacts of the Benicia Business Park Master Plan in accordance with CEQA. Cumulative impacts are discussed in Chapter V of this EIR. Recommended mitigation measures follow each significant adverse impact.

1. Issues Addressed in the EIR/EIS

The following environmental topics are addressed in this chapter:

- Land Use and Policy (LU)
- Geology, Soils and Seismicity (GEO)
- Hydrology and Water Quality (HYDRO)
- Hazardous Materials (HAZ)
- Biological Resources (BIO)
- Transportation and Circulation (TRAN)
- Air Quality (AIR)
- Visual (VIS)
- Cultural Resources (CULT)

2. Format of Environmental Discussion

Each topical section contains the following sub-sections:

- *Setting* provides a description of the existing setting as it pertains to the specific topic. Plans, goals and policies are also identified.
- *Summary of Impacts and Mitigation Measures* provides a summary of less-than-significant impacts, identification of significant impacts, and recommended mitigation measures to reduce or avoid significant impacts.

The impact statement is followed by a parenthetical symbol indicating the level of significance for each impact. A similar symbol is used to indicate the level of significance of the impact after implementation of the mitigation measure. These symbols are:

- S = Significant Impact
- LTS = Less Than Significant Impact
- SU = Significant Unavoidable Impact

A. LAND USE AND POLICY

■ ■ ■

This section describes existing land uses at the Project site and the surrounding area, and evaluates the compatibility of the proposed Project land uses with existing land uses. Relevant land use policies of the Benicia General Plan are also summarized. The relationship of the proposed Project with the applicable land use and open space policies is evaluated. Project consistency with policies related to specific topical areas analyzed in the EIR are listed in Table IVA-1 in this chapter, and discussed in detail in those relevant topical subsections of the EIR.

1. Setting

This section focuses on existing land use, relevant planning documents, and zoning regulations.

a. Existing Conditions and Land Use at the Project Site. The proposed Project site consists of 527.8 acres of undeveloped land, currently in use as grazing land. The site is also interspersed with six drainage swales and associated riparian vegetation. The site is traversed by Reservoir Road, a 20-foot wide paved two-lane road that extends from East Second Street to Lake Herman Road. Although informal trails and unpaved double track roadways exist in several locations throughout the site, there are no additional formal or paved roadways on the site. The remains of several farm buildings, barns and a water tower exist in four places on the site. Views of the site can be found in this document in Section IV.H, Visual Quality section.

The Project site is currently used for grazing. The site has not been identified as Prime Farmland or Farmland of Statewide or Local Importance by the Important Farmland Mapping Program.

b. Existing Land Use in the Project Vicinity. Existing land uses in the Project vicinity are shown in Figure IV.A-1, and described in more detail below.

(1) North of the Project Site. Lake Herman Road comprises most of the northern border of the Project site. Land associated with the former International

Technology (IT) Panoche Facility, is located north of Lake Herman Road. From Lake Herman Road, the IT land appears undeveloped. Other undeveloped land surrounds the IT property north of Lake Herman Road. The City of Benicia Water Treatment Plant property is located south of Lake Herman Road, surrounded on three sides by the Project site.

(2) South of the Project Site. Light industrial uses are located along Reservoir Road, Industrial Way and East Second Street, south and southwest of the Project site. The Benicia Bible Church is located in a warehouse structure about 250 feet south of East Second Street in this light industrial area south of the Project site. The Exxon refinery is located southwest of the Project site, and is visible when looking south from the higher elevations in the northern portions of the site.

(3) East of the Project Site. A commercial center including a combined gas station, convenience market, and fast food establishment is located at the intersection of East Second Street and I-680 immediately east of the Project site. Immediately east of this commercial development, and east of the remainder of the Project site, is I-680, which runs in a roughly north-south direction west of the Southern Pacific Railroad tracks and the Suisun Bay. Commercial and light industrial uses are found between the Southern Pacific Railroad tracks and I-680.

(4) West of the Project Site. The area west of the Project site is largely comprised of open space and recreational uses. The eastern boundary of the Lake Herman Regional Park is located about ½ mile west of the Project site on Lake Herman Road. Some industrial uses are located along Industrial Way, west of Channel Road and California Court, west of the site and north of East Second Street.

c. Guiding Documents. The main guiding documents for the proposed Project are the City of Benicia General Plan and the City of Benicia Zoning Ordinance. The City's Zoning Ordinance is intended to be the primary instrument for implementing the General Plan. A discussion of the proposed Project's relationship to relevant policies of the Benicia General Plan and Zoning Ordinance follows.

(1) City of Benicia General Plan. The City of Benicia General Plan (General Plan) is the principal policy document for guiding future land use, conservation, and development in the City. The General Plan serves as a comprehensive guide for making decisions about land use, economic development, road improvements, and protection of natural resources and public health and safety. It also provides the legal foundation for all zoning, subdivision, and public facilities ordinances, decisions, and projects.



LEGEND

Industrial	Office/Business Park/ Mixed Use	Urban Growth Boundary
Institutional	Transportation	Planning Area Boundary
Retail/Commercial	Undeveloped and/or Grazing Land	City Limits
Parks/Open Space	Project Boundary	Project Boundary

BENICIA BUSINESS PARK

LSA

Figure IV.A-1
Existing Land Use

The General Plan has recently undergone a comprehensive revision, and was readopted in August 1999. Table IV.A-1 outlines the project's consistency, prior to mitigation, with relevant policies of the 1999 General Plan. Policies and programs related to Geology, Soils, and Seismicity; Hydrology and Water Quality; Biological Resources; Transportation and Circulation; Air Quality; and Visual Quality are also discussed in those topical subsections of the EIR. Hazardous Materials policies are discussed in Section IV.D of the EIR.

The following sections of the General Plan are relevant to the proposed Project:

(a) *Land Use and Growth Management.* This section of the General Plan cover policies and programs affecting the development of land in Benicia. Land use goals and policies relevant to the Project are summarized in Table IV.A-1. The Project's consistency with policies directly related to land use is discussed in Section 2, Impacts and Mitigation Measures, below.

The City of Benicia's 1999 General Plan Land Use diagram designates limited industrial and general commercial uses for the site. The General Plan land use designations for the site and vicinity are shown in Figure IV.A-2.

(b) *Economic Development.* This section of the General Plan addresses land development in all the business and commercial sectors of the City.

(c) *Circulation.* This section of the General Plan examines the relationship of freeways to Benicia, in-town traffic and mass transit. The Project's relationship to relevant policies of this element is outlined in Section IV.F, Transportation and Circulation, and in Table IV.A-1.

(d) *Community Services.* Community services policies relevant to the proposed Project are summarized in Table IV.A-1.

(e) *Historic Resources.* This section of the General Plan addresses preservation of historic areas and resources. Policies related to Historic Resources are outlined in Table IV.A-1.

(f) *Visual Character.* This section of the General Plan addresses the location, mass and arrangement of the various components of development. The Project's relationship to relevant policies of this element is discussed in Table IV.A-1 and Section IV.H, Visual Quality.

Table IV.A-1
RELATIONSHIP OF PROJECT TO RELEVANT CITY OF BENICIA GENERAL PLAN POLICIES

Goal/Program/ Policy Number	Policy Summary	Project's Relationship to Policy
<i>Growth Management</i>		
2.1.1	Ensure that new development is compatible with adjacent existing development and does not detract from Benicia's small town qualities and historic heritage (and to the extent possible, contributes to the applicable quality of life factors noted above).	<i>Consistent.</i> The Project is compatible with adjacent existing development. Due to the distance of the site from the historic Downtown, it does not detract from the City's small town qualities and historic heritage.
2.1.2	Make efficient use of land in new development areas consistent with the surrounding neighborhood.	<i>Consistent.</i> The proposed Project is consistent with the existing commercial and industrial uses to the south of the Project site, and provides a topographic and landscape buffer along Lake Herman Road to protect views.
2.1.4	Strive to preserve significant areas of vegetation and open space when approving development projects.	<i>Consistent.</i> The Project includes landscape and buffer zones, and preserves steep hillsides as open space. Approximately one-third of the site is proposed for retention as open space. The project proposes to retain mature trees and also preserves vegetation along major riparian corridors within the project site. In addition, the proposed wetland mitigation plan would replace wetland vegetation lost as a result of development. See also Section IV.E, Biological Resources.
2.2.1	Protect and maintain agricultural and rural land uses, hillsides, two-lane curving roads, watershed, riparian corridors and upland grasslands.	<i>Potentially inconsistent.</i> The Project would replace agricultural uses with commercial and industrial uses and would remove Reservoir Road. The proposed Project's effects on riparian resources are discussed in Section IV.E, Biological Resources. Consistency with this policy is discussed below in Section 2, Impacts and Mitigation Measures.
Goal 2.3	Ensure orderly and sensitive site planning and design for large undeveloped areas of the City, consistent with the land use designations and other policies in this General Plan.	<i>Consistent.</i> The Project is consistent with the design guidelines and land use designations in the General Plan.
2.3.1	Require a Master Plan for new developments on properties under common or single ownership which aggregate to more than 40 acres.	<i>Consistent.</i> A Master Plan has been developed for the Project.
Program 2.3.A	Ensure adequate funding is available for the long-term maintenance of undeveloped areas preserved when approving land divisions.	<i>Potentially Inconsistent.</i> The applicant should provide funding to maintain open space areas within the Project site. Consistency with this policy is discussed below in Section 2, Impacts and Mitigation Measures. See Mitigation Measure LU-1.

Table IV.A-1 *continued*

Goal/Program/ Policy Number	Policy Summary	Project's Relationship to Policy
<i>Economic Development</i>		
Goal 2.6	Attract and retain a balance of different kinds of industrial uses to Benicia.	<i>Consistent.</i> This Project has the potential to attract different kinds of industrial uses by providing flexible development sites which can be merged to provide large sites for bigger facilities or developed individually for smaller facilities.
2.6.1	Preserve industrial land for industrial purposes and certain compatible "service commercial" and ancillary on-site retail uses.	<i>Consistent.</i> This Project provides development sites for industrial uses and for the commercial services that provide for these industries.
2.6.4	Link any expansion of Industrial land use to the provision of infrastructure and public services that are to be developed and in place prior to the expansion.	<i>Consistent.</i> The Project would require expansion of infrastructure prior to construction of industrial uses. Although expansion of existing systems would be required, given that the Project is consistent with the General Plan and that the project will be subject to the City's standard Conditions of Approval relating to the extension of services, including assessment of fees for the costs of on-site and off-site improvement necessary to serve the Project, this impact is considered less than significant. This topic is discussed in more detail in the Initial Study, which can be found in Appendix A of this document.
2.6.5	Establish and maintain a land buffer between industrial/commercial uses and existing and future residential uses for reasons of health, safety, and quality of life.	<i>Consistent.</i> The proposed Project would provide a buffer between the proposed land uses and Lake Herman Road. There are no areas with residential General Plan land use designations adjacent to the Project site.
Goal 2.7	Attract and retain industrial facilities that provide fiscal and economic benefits to- and meet the present and future needs of- Benicia.	<i>Consistent.</i> This Project has the potential to attract industrial facilities to Benicia. The proposed grading plan would create a large, gently-sloping site that would allow for flexible development accommodating either a single large facility or several smaller businesses.
<i>Circulation</i>		
2.14.1	Give priority to pedestrian safety, access and transit over automobile speed and volume.	<i>Potentially inconsistent.</i> Mitigations to require increased sidewalk widths and transit service extension are outlined in Section IV.F, Transportation and Circulation, under Mitigation Measures TRAN-8 and TRAN-9.
2.14.2	Discourage street widening and the removal of on-street parking to ease traffic flow.	<i>Consistent.</i> On-street parking would not be removed as part of the project. Roadways would be constructed to City standards, per Mitigation Measure TRAN-5.
Goal 2.15	Provide a comprehensive system of pedestrian and bicycle routes which link the various components of the community: employment centers, residential areas, commercial areas, schools, parks and open space.	<i>Potentially inconsistent.</i> The topic of bicycle access is discussed in more detail in Section IV.F, Transportation and Circulation.

Table IV.A-1 *continued*

Goal/Program/ Policy Number	Policy Summary	Project's Relationship to Policy
2.20.1	Maintain at least LOS D on all city roads, street segments and intersections.	<i>Potentially inconsistent.</i> Mitigation Measure TRAN-1 in Section IV.F outlines measures to bring intersections up to LOS D or better.
2.20.3	Maintain Lake Herman Road as a rural, two-lane, curving scenic route.	<i>Consistent.</i> While Lake Herman Road forms the northern boundary for this Project, the circulation and access to the site will concentrate on East Second Street and Industrial Way, and Lake Herman Road would not be widened as part of the Project. Most scenic views along the road would be preserved by maintaining open space hillsides and landscaped buffer areas. Preservation of views along Lake Herman Road is discussed in more detail in Section IV.H, Visual Quality.
2.23.1	Provide adequate on-street and off-street parking.	<i>Potentially inconsistent.</i> Mitigation Measure TRAN-6 in Section IV.F addresses potential parking impacts.
2.23.2	Reduce the visibility of parking lots.	<i>Potentially inconsistent.</i> Development proposals for individual lots would be subject to design review.
2.24.1	Continue to ensure public access to private roads in the industrial and Port areas.	<i>Consistent.</i> No private roads are proposed as part of this project.
Goal 2.26	Ensure that scenic and environmental amenities of I-680 and I-780 are not compromised.	<i>Potentially inconsistent.</i> The Project's effects on visual quality from scenic overlooks located along I-680 are discussed in more detail in Section IV.H, Visual Quality.
Community Services		
2.28.1	Require that new development not reduce the levels of service in existing neighborhoods below City standards.	<i>Consistent.</i> Public services are discussed in the Initial study, which can be found in Appendix A.
Program 2.30.I	Use primarily native plant species and other drought tolerant plants in all parks and open space areas.	<i>Consistent.</i> The applicant proposes to revegetate open space areas that are affected by grading with native grasses and native shrubs in order to retain their natural character.
Cultural and Historic Resources		
Goal 3.1	Maintain and enhance Benicia's historic character.	<i>Potentially inconsistent.</i> Potentially historic structures would be demolished with project implementation.
3.1.1	Encourage reuse of historic buildings; if feasible, encourage relocation rather than demolition.	<i>Potentially inconsistent.</i> Potentially historic structures would be demolished with project implementation.
Goal 3.2	Protect archaeological (including underwater) sites and resources.	<i>Potentially inconsistent.</i> This EIR includes mitigations to prevent impacts to buried archaeological resources.

Table IV.A-1 *continued*

Goal/Program/ Policy Number	Policy Summary	Project's Relationship to Policy
3.2.1	Ensure the protection and preservation of artifacts in known, and as yet unidentified, areas.	<i>Potentially inconsistent.</i> See above.
Program 3.2.B	Refer development proposals that may adversely affect archaeological sites to the California Archaeological Inventory.	<i>Potentially inconsistent.</i> [to be determined by City staff]
Program 3.2.D	Require that all sites with archaeological resources likely to be disturbed by a proposed project be analyzed by a qualified archaeologist and an appropriate program developed to mitigate any impacts from the project.	<i>Consistent.</i> Mitigation measures to avoid harm to archaeological resources have been incorporated into the EIR in Section IV.I, Cultural Resources.
Visual Character		
3.7.3	Encourage consistent street tree planting, other types of landscaping, and neighborhood gardens.	<i>Consistent.</i> Street trees and other landscaping are proposed in the Project area.
3.7.4	Where feasible, install and maintain landscape (planter) strips that separate sidewalks from the streets.	<i>Consistent.</i> Landscape strips are proposed within the Project site (although the City does not provide sidewalks in Industrial areas).
Goal 3.9	Protect and enhance scenic roads and highways.	<i>Potentially inconsistent.</i> This topic is discussed in more detail in Section IV.H, Visual Quality.
3.9.1	Preserve vistas along I-780 and I-680.	<i>Potentially inconsistent.</i> The Project's potential effects on views from I-680 are discussed in Section IV.H, Visual Quality.
3.12.1	Encourage additional attractive, quality development in industrial areas.	<i>Consistent.</i> The City's Zoning Ordinance requires Design Review prior to final project approval. See discussion in Section IV.H, Visual Quality, under less-than-significant impacts.
Open Space and Conservation of Resources		
Goal 3.15	Provide buffers throughout the community.	<i>Consistent.</i> The Project includes landscaped buffers along Lake Herman Road and along East Second Street and Industrial Way.
3.15.1	Preserve and protect, through a variety of methods, a pattern of open space buffers and greenbelts throughout the Planning Area.	See above discussion under policies 2.1.4, 2.65, 3.7.4, and 3.15.
3.15.2	Preserve public views of public open space and maintain existing vistas (including the Northern Area vistas) wherever possible.	<i>Potentially inconsistent.</i> The Project would protect most scenic views along Lake Herman Road with the proposed berm and land bridge between Project development and Lake Herman Road. This topic is discussed in more detail in Section IV.H, Visual Quality.
3.15.6	Restore and maintain natural landscapes in a natural manner.	See above discussion under policies 2.1.4, 2.30.I, and 3.15.1.

Table IV.A-1 *continued*

Goal/Program/ Policy Number	Policy Summary	Project's Relationship to Policy
Biological Resources		
Goal 3.19	Preserve and enhance habitat for special-status plants and animals.	<i>Potentially inconsistent.</i> Potential significant impacts to special status species can be reduced to less than significant levels with mitigation. See Mitigation Measures BIO-3 through BIO-6 in Section IV.E, Biological Resources.
Goal 3.20	Protect and enhance native vegetation and habitats.	<i>Consistent.</i> The project proposes to retain mature trees and also preserves vegetation along major riparian corridors within the project site. In addition, the wetland mitigation plan, proposed by the project, would replace wetland vegetation lost as a result of development. See also Section IV.E, Biological Resources.
3.20.1	Protect native grasslands, oak woodlands and riparian habitat.	See above discussion under policies 2.1.4, 2.30.1, and 3.20.
Program 3.20.B	Limit the loss of native vegetation or require mitigation or both.	See above discussion under policies 2.1.4, 2.30.1, and 3.20.
3.20.3	Encourage preservation of existing trees. Especially preserve and protect mature, healthy trees whenever practicable, particularly where such trees are of significant size or are of significant aesthetic value to the immediate vicinity or to the community as a whole.	<i>Consistent.</i> See Goal 3.19 above and discussion under Impact BIO-1 in Section IV.E, Biological Resources.
Goal 3.21	Permanently protect and enhance wetlands so that there is no net loss of wetlands within the Benicia Planning Area.	<i>Potentially inconsistent.</i> With mitigation, wetlands would be replaced at a ratio of slightly more than 2:1. See discussion under Impact BIO-1 in Section IV.E, Biological Resources.
3.21.1	Encourage avoidance and enhancement of sensitive wetlands as part of future development.	See discussion under Goal 3.21 above.
3.21.2	Require replacement for wetlands eliminated as a result of development at a higher wetlands value and acreage than the area eliminated.	See discussion under Goal 3.21 above.
Program 3.21.E	Identify small wetlands and require their protection, restoration, and enhancement as part of open space dedication in proposed development and in citywide open space improvements.	<i>Consistent.</i> Several wetlands areas are proposed for retention on the project site. Lost wetlands would be replaced at a 2:1 ratio. See Figure III-8 in the Project Description and discussion under Impact BIO-1 in Section IV.E, Biological Resources.



Source: City of Benicia, 1999; LSA Associates, 2000.

LEGEND	
OPEN SPACE	
	Marsh
	General
	Parks
COMMERCIAL	
	General
	Limited
INDUSTRIAL	
	General
	Limited
Urban Growth Boundary	
	Urban Growth Boundary
Planning Area Boundary	
	Planning Area Boundary
City Limits	
	City Limits
Project Boundary	
	Project Boundary

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Figure IV.A-2
General Plan
Land Use Designations

(g) *Open Space and Conservation.* This element of the City's General Plan focuses on protection and enhancement of the natural environment, including open space, water and air and plants and animals. The Project's relationship to relevant parks and open space policies is discussed in Table IV.A-1 and Section 2, Impacts and Mitigation Measures, below. The Project's relationship to biological resource and hydrological policies is outlined in Table IV.A-1 and discussed in Sections IV.E, Biological Resources, and IV.C, Hydrology and Water Quality.

(h) *Hazards.* Relevant policies from the General Plan sections related to Hazards ("Hazards to the Community" and "Responses to Hazards") are discussed in Section IV.D, Hazardous Materials.

(2) City of Benicia Zoning Ordinance. The broad purposes of the Benicia Zoning Ordinance are to protect and promote the public health, safety, and general welfare of the citizens of Benicia, and to implement the policies of the City's General Plan. The zoning ordinance is composed of: 1) a set of regulations establishing various classes of zoning districts and governing land use and the placement of buildings and improvements within districts; and 2) a set of maps showing the boundaries of zoning districts within the City.

Approximately 40 acres of land in the eastern portion of the Master Plan area are designated General Commercial (CG), with the remainder of the site designated Limited Industrial (IL) in the City's Zoning Ordinance. The entire area has a Master Plan Overlay zoning designation. A Master Plan is required by the City of Benicia General Plan for properties under common ownership which aggregate to more than 40 acres. The goals of the master plan process are to encourage the best and most effective use of properties and to allow the City to project the need for and plan future public services and facilities. The City has initiated rezoning from CG to IL of an 8.8 acre area of the site. This area is adjacent to the existing commercial land within the site.

Allowable uses for these zoning designations include the following:

- *General Commercial* allows for most business and retail uses, including restaurants; maintenance and repair services; offices; hotels and motels; and retail sales.
- *Limited Industrial* permits manufacturing, assembly, and packaging of goods and products from previously prepared materials; wholesale, distribution, and storage facilities; research and development facilities; and related industrial and commercial services. Additional uses, including auto sales and services, mini-storage, eating and drinking establishments, and churches may be allowed with approval of a use permit.

The likely commercial uses for the proposed Project area would be an expansion of existing types of commercial facilities to serve existing and proposed industrial and freeway uses. The commercial facilities would be accessible from I-680. Several possible industrial lot development conceptual plans are shown in the Project Description, Chapter III, in Figure III-5.

2. Impacts and Mitigation Measures

a. Thresholds of Significance. As defined in Appendix G of the *CEQA Guidelines* and in accordance with policies of the City's General Plan, the proposed Project would have significant land use and planning impacts if it would:

- Create direct physical impacts associated with a conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the Project, including General Plan and Zoning designations and policies;
- Be incompatible with existing land use in the vicinity;
- Affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses); or
- Disrupt or divide the physical arrangement of an established community (including a low-income or minority community).

b. Less-than-Significant Land Use Impacts.

(1) General Plan and Zoning. As noted above, the site is designated for Limited Industrial and General Commercial land uses in the Benicia General Plan. The proposed Project would not conflict with these General Plan land use designations. An 8.8-acre portion of the site adjacent to, and west of, existing commercially zoned land was recently rezoned from IL (Light Industrial) to CG (General Commercial). The change in zoning designation at the site was required to avoid impacts to wetlands and has been incorporated into the Project description. Rezoning would reconfigure the area zoned for commercial use on the site; however, it would not substantially increase commercially zoned land, and would not result in significant land use impacts.

(2) General Plan Policies. The Project's relationship to relevant General Plan policies is summarized in Table IV.A-1. This section discusses those policies with which the Project may be potentially inconsistent which are not discussed in other topical subsections of the EIR, including topical areas such as open space and conservation and growth management. Policies for which the proposed Project is listed as "consistent" in Table IV.A-1 are not discussed again here.

Impact LU-1: The proposed Project could conflict with some policies of the General Plan related to open space and scenic resource maintenance. (LTS)

The proposed Project is potentially inconsistent with General Plan Policy 2.2.1 which calls for the protection and maintenance of agricultural land uses, hillsides, two lane curving roads, watershed, riparian corridors and upland grasslands. It should be noted that the Project would not involve the widening of Lake Herman Road to accommodate increased traffic. In addition, although significant terrain modification would occur with Project implementation, the Project would create about 170 acres of permanent open space and a landscaped berm between the Project and Lake Herman Road would create new upland grasslands. However, grazing uses would be converted to developed land, and some riparian corridors would be filled as part of the Project. The conversion of riparian corridors is discussed in this document in more detail in Section IV.E, Biological Resources. Although the Project would potentially conflict with this General Plan policy, conversion of the site from grazing land to industrial and commercially developed uses as envisioned by the City's General Plan, would not be considered significant. Therefore, no mitigation would be required.

The proposed Project could potentially conflict with General Plan Program 2.3.A which calls for funding for open space maintenance.

Mitigation Measure LU-1: The Project applicant should provide a funding mechanism to ensure long-term maintenance of the permanent open space areas dedicated as part of the Project. Funding mechanisms could include formation of a business owners association. Preparation and City approval of an open space maintenance plan shall be required as part of the final subdivision map. (LTS)

(3) Adjacent Land Uses. Existing land uses at the Project site and within the Project area are shown in Figure IV.A-1. The commercial and industrial uses proposed as part of this Project would be consistent with adjacent industrial, commercial and undeveloped/grazing uses. One sensitive receptor, the Benicia Bible Church, is located south of the Project site, approximately 250 feet south of East Second Street. The church is located within an area designated in the Benicia General Plan and Zoning Ordinance for industrial uses and is located in a warehouse-type structure within an existing industrial development. A noise analysis was performed as part of the Initial Study for this Project to estimate the amount of ambient noise created at the Project site that would be present within the interior of the church. The noise analysis determined that because of the Church's distance from the site and its location within a warehouse structure in an established industrial complex, ambient noise levels within the church interior would not be increased to significant levels with project implementation. Therefore, the Project

would not create a land use conflict between proposed industrial uses and the church. The noise analysis can be found in Section X of the Initial Study, located in Appendix A of this document. There would be no other potential land use conflicts between proposed industrial and commercial uses and nearby sensitive receptors. The proposed Project is not expected to result in the disruption or division of an established community.

(4) Agricultural Operations. No impacts to agricultural operations would occur with Project implementation. Conversion of the site from grazing land to industrial and commercially developed uses on lands categorized as grazing land by the Important Farmland Mapping Program would not be considered significant. The proposed Project would not convert prime agricultural land to non-agricultural uses.

c. Significant Impacts. No significant direct land use impacts would occur with Project implementation.

B. GEOLOGY AND SOILS

■ ■ ■

This section assesses the geotechnical conditions potentially affecting the proposed development of industrial and commercial uses at the Project site. The analysis is based on the review of published reports on geologic, hydrogeologic, and seismic conditions within the Project site. The sources of regional information include the U.S. Geological Survey, California Division of Mines and Geology, the National Resources Conservation Service (formerly known as the U.S. Soil Conservation Service), and a site-specific geotechnical investigation (ENGEO, 1998). This section also assesses potential impacts from severe seismic shaking, liquefaction, and differential settlement that could result from seismic activity.

Site-specific geotechnical investigation has been conducted at the site by ENGEO, Inc. in 1981 and 1998 to support proposed development. The 1981 investigation included installation of 17 soil borings (ranging in depth from 5 to 35 feet below the surface), 6 test pits, 3 trenches, and 3 seismic lines.¹ The 1998 investigation included installation and sampling of eight soil borings (ranging in depth from 15 to 111 feet below the ground surface).² ENGEO also mapped the surficial geology at the site in 1998, including the locations of eight shallow landslides.

1. Existing Setting

a. Regional Geology. The Project site is located on the northern margin of the Carquinez Strait, the geologic and hydrologic transition area linking Suisun Bay and the Sacramento River Delta to San Pablo Bay. The regional geologic setting is the Coast Range Geomorphic Province of California. Within this broadly defined region between the Pacific Ocean to the west and the Central Valley to the east, the topography is characterized by a series of northwest-southeast trending uplands or low mountain ranges and intervening valleys. Carquinez Strait is a relatively narrow valley cut through an upland area underlain by resistant sedimentary bedrock of the

¹ ENGEO, Inc., 1981. Geotechnical Exploration for Primary Development Plan, A.D. Seeno Property, 684 acres, Benicia, California, File N1-1708-B1 (unpublished report). June 30.

² ENGEO, Inc., 1998. *Preliminary Geotechnical Exploration, Lake Herman Road Industrial Park, Benicia, California*, prepared for West Coast Builders, Inc.. 36 p. + figures.

Upper Cretaceous Great Valley Sequence and younger Tertiary sedimentary rocks.³ The upland is bounded by tidal lowlands at the margins of Suisun Bay (to the east) and at the confluence of the Napa River and San Pablo Bay (to the west).

b. Site Geology. The geologic materials underlying at the Project site include Cretaceous to Jurassic-age sedimentary bedrock, Quaternary alluvium, colluvium, and terrace deposits, and landslide deposits. A generalized geologic map of the site is presented as Figure IV.B-1. The Cretaceous to Jurassic-age bedrock has been variously mapped as the Chico Formation, unnamed mudstone, siltstone, shale, sandstone, and conglomerates, and the Panoche Formation (western portion of the site).⁴ The bedrock has been folded and faulted but maintains a relatively consistent attitude (orientation) throughout the Project site. The bedding strikes northwestward and dips 25 to 60 degrees to the northeast.⁵ The bedrock is extensively fractured and weathered in outcrops (exposed bedrock) in the Project site.

The bedrock is mantled with unconsolidated sediments derived from physical and chemical weathering of the bedrock. These materials are transported downslope under the influence of gravity and are referred to as colluvium. The thickness of colluvium is variable but is typically thinner on upper portions of slopes and thicker at the base (or toe) of the slopes. However, the colluvium is locally thicker in swales that naturally form on the slopes as the natural surface water drainage system develops. The colluvium was found to range from 4 to 15 feet in thickness in geologic borings installed at the site, and is considered to be highly expansive.⁶

Alluvium, a term referring to deposits associated with rivers or streams, occurs in relatively narrow bands in and adjacent to the drainage channels and in low-lying areas. The alluvial deposits at the site consist of unconsolidated clay, silt, sand and gravel ranging in thickness from four to 21 feet. Based on laboratory testing, these deposits are considered to be moderately to highly expansive.⁷ Alluvial terrace

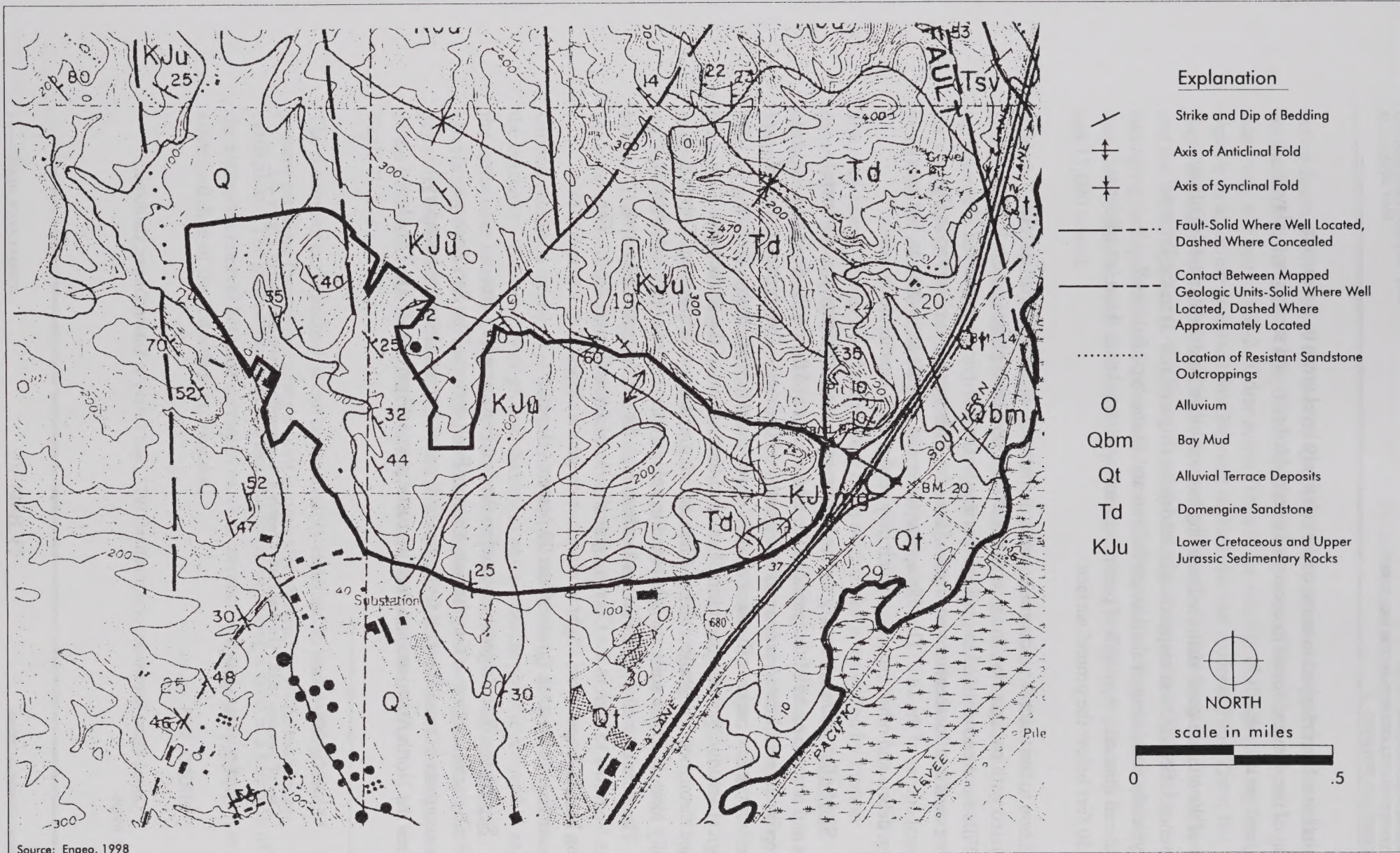
³ Dibblee, T., 1980. Geologic Map of the Benicia Quadrangle, California, U.S. Geological Survey Open File Map OF 80-400, scale 1:24,000.

⁴ ENGEO Incorporated, 1998, *Preliminary Geotechnical Exploration, Lake Herman Road Industrial Park, Benicia, California*, prepared for West Coast Builders, Inc., 36 p. + Figures.

⁵ ENGEO, 1998, op. cit.

⁶ ENGEO, 1998, op. cit.

⁷ ENGEO, 1998, op. cit.



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Figure IV-B.1
Regional Geology

deposits have been mapped in some of the relatively level areas in the eastern portion of the site, and found to consist of interbedded silty and sandy clays, clayey sands, and gravelly sands.⁸

Much of the site has been identified as being susceptible to landslide and debris flow occurrence.⁹ ENGEO has mapped eight landslides (Figure IV.B-3) in the Project site, typically consisting of shallow earthflows and slump-type failures.¹⁰ Considered dormant, the depth of past movement associated with these landslides is 10 to 30 feet below the ground surface.

In addition to the naturally-occurring geologic materials at the site, artificial fills associated with past grading and quarry operations have been placed on the Project site. Fills were encountered in geologic borings in the low-lying areas in the southwestern and southeastern portions of the site. Fills were also observed in the northeast corner of the site. The fills appear to consist of soils from the site, but may contain debris and other materials which may render them unsuitable for reuse.¹¹

c. Site Soils. Soil is generally defined as the unconsolidated mixture of mineral grains and organic material that mantles the land surfaces of the earth. Soils can develop on unconsolidated sediments and weathered bedrock. The characteristics of soil reflect the five major influences on their development: topography, climate, biological activity, parent (source) material, and time. Most of the surface soil mapped throughout the Project site is Altamont clay with lesser amounts of Corning gravelly loam.¹² These soils are developed in upland areas underlain by sedimentary rock. The shrink-swell potential is moderate to high for the Altamont clay and ranges from low to high in the Corning gravelly loam, depending on depth. The erosion hazard ranges from slight to moderate on gentle slopes (2 to 9 percent) to moderate to high on steep (greater than 30 percent) slopes.

d. Seismicity. The Project is located in the San Francisco Bay area, a seismically active region within the San Andreas Fault system. The San Andreas system consists of several major faults and fault zones formed along the boundary between the North American and Pacific crustal plates (Figure IV.B-2). The closest

⁸ ENGEO, 1998, op. cit.

⁹ City of Benicia, 1998. General Plan, Chapter 4, Community Health and Safety, Figure 4-2.

¹⁰ ENGEO, 1998, op. cit.

¹¹ ENGEO, 1998, op. cit.

¹² United States Department of Agriculture, 1977. Soil Survey of Solano County, California, 112 p. + maps.

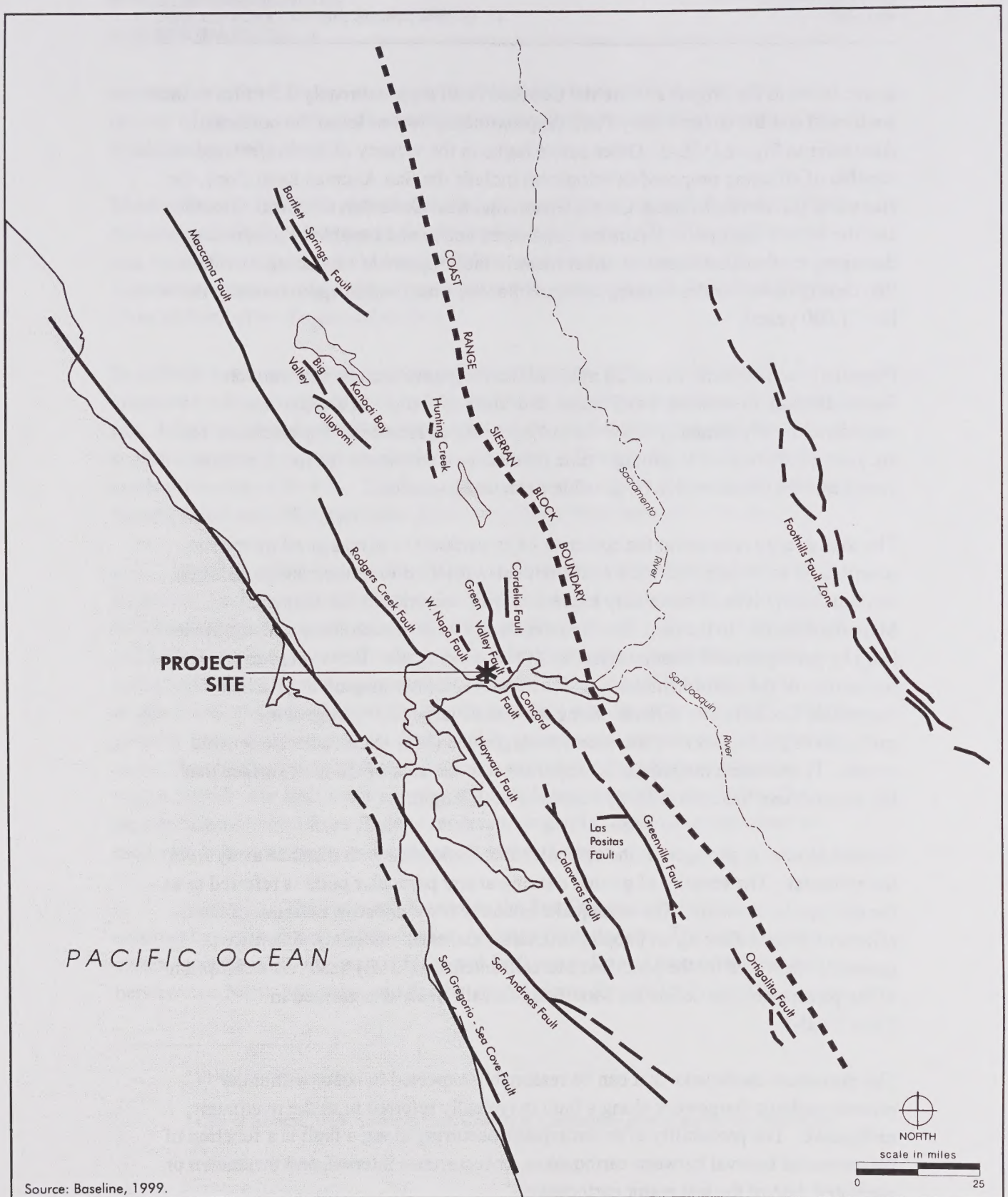
active faults to the Project site are the Concord Fault (approximately 2.5 miles to the southeast) and the Green Valley Fault (approximately two miles to the northeast). Also refer to Figure IV.B-2. Other active faults in the vicinity of the Project site and capable of affecting proposed development include the San Andreas Fault Zone, the Hayward, Calaveras, Rodgers Creek, Greenville, Seal Cove-San Gregorio, Cordelia, and the West Napa faults. Faults are considered active and capable of generating damaging earthquakes based on either historic fault rupture or on geologic evidence that clearly demonstrates faulting during Holocene time (within approximately the last 11,000 years).

Potentially active faults within 20 miles of the study area include the Antioch, Southhampton, Livermore, Los Positas, and Midway faults. Faults that are considered to be potentially active do not have known Holocene displacement, but are young with respect to geologic time (evidence of activity in the last 2 million years) and are considered to be possible earthquake sources.

The total energy released at the epicenter of an earthquake is measured by motion recorded by seismographs. This measurement is referred to as the magnitude of the earthquake and is most accurately expressed with reference to the Moment Magnitude Scale. In the past, the common standard for measurement of magnitude (M_L) by geologists and seismologists was the Richter Scale. However, due to limitations of the instrumentation used to measure Richter magnitude [Richter magnitude has difficulty differentiating the size of large (7.5+) magnitude earthquakes], scientists now use moment magnitude (M_w) to characterize seismic events. The moment magnitude is proportional to the area of the fault surface that has slipped, and therefore directly related to fault length.

Ground motion is strongest at the epicenter and diminishes with distance away from the epicenter. The severity of ground shaking at any particular point is referred to as the earthquake intensity. The earthquake intensity is a subjective measure of the effects of ground shaking on people, structures, and earth materials. Intensity is generally expressed by the Modified Mercalli Intensity (MMI) Scale. A description of the parameters that define the Modified Mercalli Scale is presented in Table IV.B-1.

The maximum earthquake that can be reasonably expected to occur within the present geologic framework along a fault is typically referred to as the maximum earthquake. The probability of an earthquake occurring along a fault is a function of the estimated interval between earthquakes, or recurrence interval, and the known or estimated date of the last major earthquake.



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LEGEND

- Active Fault -
Fault has evidence of surface
displacement within the last
11,000 years (dashed where
inferred)

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Figure IV.B-2
Regional Faults

**Table IV.B-1
MODIFIED MERCALLI SCALE^a**

	Intensity	Effects	v, ^b cm/s	g ^c
M ^d	I.	Not felt. Marginal and long-period effects of large earthquakes.		
3	II.	Felt by persons at rest, on upper floors, or favorably placed.		
	III.	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.		0.0035-0.007
4	IV.	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV wooden walls and frame creak.		0.007-0.015
	V.	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.	1-3	0.015-0.035
5	VI.	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle - CFR).	3-7	0.035-0.07
6	VII.	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments - CFR). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.	7-20	0.07-0.15
	VIII.	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.	20-60	0.15-0.35
7	IX.	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations - CFR.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluviated areas sand and mud ejected, earthquake foundations, sand craters.	60-200	0.35-0.7
8	X.	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.	200-500	0.7-1.2
	XI.	Rails bent greatly. Underground pipelines completely out of service.		>1.2
	XII.	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.		

^a From Richter (1958).

^b Average peak ground velocity, centimeters per second (cm/s).

^c Average peak acceleration (away from source).

^d Richter magnitude correlation.

Note: *Masonry A, B, C, D.* To avoid ambiguity of language, the quality of masonry, brick or otherwise, is specified by the following lettering (which has no connection with the conventional Class A, B, C construction).

- *Masonry A:* Good workmanship, mortar, and design, reinforced, especially laterally, and bound together by using steel, concrete, etc; designed to resist lateral forces.
- *Masonry B:* Good workmanship and mortar, reinforced, but not designed to resist lateral forces.
- *Masonry C:* Ordinary workmanship and mortar; no extreme weaknesses such as non-tied-in corners, but masonry is neither reinforced nor designed against horizontal forces.
- *Masonry D:* Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.

No known active fault traces cross the Project; thus, the potential for fault rupture at the site is low. The closest known active faults are the Concord and Green Valley faults (often referred to as the Concord-Green Valley fault system since they may represent portions of one continuous fault on either side of the Carquinez Strait). The estimated maximum intensity for ground shaking at the site during the maximum earthquake on the Concord-Green Valley Fault (magnitude 7.1) ranges from MMI VIII (very strong) to MMI X (very violent) depending on geologic underlying materials.¹³ Loosely consolidated alluvium and colluvium would be expected to have stronger groundshaking than bedrock areas.

The Coast Range-Sierran Block Boundary (CRSBB) forms the western geomorphic boundary of the Central Valley with the Coast Ranges to the west. This boundary is underlain by a seismically active fold and thrust belt. The CRSBB is generally defined as the range front at the western margin of the Coast Ranges. The study area is within this broadly defined boundary. The CRSBB is currently recognized as a potential seismic source, capable of generating moderate earthquakes within the study area.¹⁴ Recent evaluations of the CRSBB indicate that tectonic compression occurs across the boundary as the Coast Range Block is tectonically pushed beneath the Sierran Block. The result of this active compression is the development of folds and thrust faults within the CRSBB. The faults associated with this zone do not typically propagate to the surface and are, therefore, called "blind thrusts." Because the faults are not expressed at the surface, identification of the locations of the faults cannot, typically, be determined on the basis of geomorphic evidence. However, the compressional zone is considered capable of generating moderate to large earthquakes that could produce strong seismic shaking throughout the region, including the study area. Eleven moderate earthquakes (M5.8 to M6.8) have been documented along the CRSBB zone during the last 150 years, including the 1892 Winters earthquakes.¹⁵ The 1983 Coalinga earthquake (Magnitude 6.7) is an recent example of an earthquake that occurred on a blind thrust within the northern portion of the CRSBB zone.

The U.S. Geological Survey (USGS) estimates the probability of a large earthquake of magnitude 7.0 or greater occurring within the San Francisco Bay area within the

¹³ Association of Bay Area Governments (ABAG), 1999. Earthquake Hazards Maps, on-line address www.abag.ca.gov/bayarea/eqmaps

¹⁴ Wong, I.G., Ely, R.W., and Lollmann, A.C., 1988. Contemporary Seismicity and Tectonics of the Northern and Central Coast Ranges-Sierran Block Boundary Zone, California, *Journal of Geophysical Research*, V. 93, pp. 7813-7833.

¹⁵ Wakabayashi, J. and Smith, D.L., 1994. Evaluation of Recurrence Intervals, Characteristic Earthquakes, and Slip Rates Associated with Thrusting along the Coast Range-Central Valley Geomorphic Boundary, California, *Bulletin of the Seismological Society of America*, Vol. 84, No. 6, pp.1960-1970.

next 30 years to be approximately 67 percent.¹⁶ This estimate reflects the combined probability of expected earthquakes on the major fault zones in the Bay Area, including the San Andreas, Hayward, Calaveras, and Rodgers Creek fault zones. Estimates for the probability of occurrence of expected earthquakes on other faults in the region, including the Concord and Green Valley faults, the closest active seismic sources to the site, have not been developed and were not included in the probability estimate. Therefore, the probability estimate, which reflects the combined probability of the occurrence of an earthquake, should be considered a minimum value.

The California Division of Mines and Geology (CDMG) has compiled regional maps identifying probabilistic levels of seismic shaking over the next 50 years with a 10 percent chance of being exceeded. The maps express the probabilistic seismic shaking levels as a percentage of the acceleration of gravity (g). The study area is expected to experience ground shaking of 0.6 to greater than 0.7g.¹⁷ This level of shaking would be equivalent to a Modified Mercalli Intensity IX.

All structures and other improvements built within the study area would be required to conform with the requirements of the California Building Code (CBC) for seismic risk Zone 4, the most stringent seismic design requirements in the U.S.¹⁸ The CBC provides seismic design requirements that have been developed to minimize the potential for building collapse and injury or death to occupants. However, the expected intensity of seismic shaking within the study area could result in significant damage even to buildings built to the current requirements of the CBC. The seismic damage susceptibility for geologic materials within the study area is generally characterized as low (in bedrock areas) and moderate to low (alluvial deposits). However, structural and non-structural damage could be caused by this expected level of shaking. The seismic shaking could also cause seismically-induced landsliding, particularly on the moderately unstable and unstable slopes (Figure IV.B-3). The potential for such land failures would be increased if the seismic shaking coincided with a prolonged or intense rainfall period when high groundwater levels may contribute to slope instability.

During moderate to strong seismic shaking, loose saturated granular sediments (sands, silty sands, and noncohesive silts) can undergo a type of ground failure

¹⁶ United States Geological Survey (USGS), 1990. Probabilities of Large Earthquakes in the San Francisco Bay Region, California, prepared by the Working Group on California Earthquake Probabilities, USGS Circular 1053, 36 p. + Appendices

¹⁷ California Division of Mines and Geology (CDMG), 1996. Probabilistic Seismic Hazard Map, Peak Horizontal Ground Acceleration 10% Probability in 50 Years, Soft Rock Site Condition.

¹⁸ California Code of Regulations, Title 24.



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Figure IV-B.3
Landslide Susceptibility

referred to as *liquefaction*. Seismic waves can cause increases in pore water pressure within sediments. Under this condition, the sediments can suddenly lose all shear strength and change from a solid to fluid state. The liquefied sediments can flow, possibly resulting in horizontal or vertical displacement of the ground surface. Such displacements can result in significant damage to buildings or other improvements constructed on liquefiable sediments. The potential for liquefaction within the Master Plan Area is characterized as generally low as the majority of the site is underlain by cohesive colluvium and bedrock and fill derived from these materials.^{19,20}

e. Slope Stability. The stability of hill slopes is a function of several interrelated factors, including the strength and structure of underlying materials, steepness of the slope, and surface and subsurface drainage. In addition to these general factors, slope stability can also be influenced by human activities, including placement of loads (e.g., buildings and other improvements) and excavation activities. While all slopes respond to the force of gravity by some amount of downslope movement of materials, it is the relatively rapid slope failures that present engineering challenges for developments on slopes.

A wide range of slope conditions exist in the hills that separate drainage swales and valleys at the site. Slope stability in these areas is controlled predominantly by the type of bedrock underlying the slope, the aspect of the slope relative to the dip of the underlying rock, the steepness of the slope, and the thickness and distribution of colluvial soils that mantle the slope. The slopes at the Project site are underlain by fine-grained sedimentary bedrock and are generally classified as moderately unstable to unstable where the slope steepness is greater than 15 percent.²¹ Site susceptibility to landslides is presented on Figure IV.B-3. Reconnaissance of the Master Plan Area has identified eight slope failures, typically consisting of shallow earthflows and slump-type failures.²²

A potential unstable slope condition could exist in areas of the site where thick colluvial deposits have accumulated in shallow swales on hill slopes. These swales form incipient drainage channels on the upper portions of the slopes in the northern portion of the Project site. These swales, known as colluvial hollows, concentrate runoff and subsurface groundwater flow during storm events and periods of

¹⁹ ABAG, 1980, op. cit.

²⁰ ENGEO, 1998, op. cit.

²¹ Nilsen, T.H. and Wright, R.H., 1979. Relative Slope Stability and Land-Use Planning, U.S. Geological Survey Professional Paper 944, 96p. + Maps.

²² ENGEO, 1998, op. cit.

prolonged rainfall. Increased groundwater levels and corresponding increases in pore water pressure are the major influence on initiation of debris flows in colluvial hollows. Colluvial hollows may generate debris flows, shallow complex landslides that form a fluid, fast-moving landslide mass. A major series of rainstorms in January 1982 induced over 18,000 landslides in the San Francisco Bay region. Though several of these landslides occurred in the vicinity of the site north of Lake Herman Road in 1982, none were identified at the project area.²³ Site susceptibility to debris flows is presented on Figure IV.B-4.

f. Mineral Resources. The Master Plan Area does not include areas identified as having significant mineral resources. Portions of the Master Plan Area and surrounding area are classified by the California Division of Mines and Geology (CDMG) as Mineral Resource Zone-1 (MRZ-1) – areas where adequate information is available that no significant mineral resource exists and MRZ-4 – areas where insufficient information is available to allow classification into other mineral resource classifications.²⁴ A portion of the site is beyond the boundaries of CDMG mapping. The geologic materials at the site, the Cretaceous-Jurassic-age bedrock and overlying colluvial deposits, are not and have not been historically extracted as mineral resources. The project area is not identified in the Benicia General Plan or the Benicia Mineral Resource Management Study as an area of mineral resource conservation.

g. Relevant Environmental Goals and Policies. The City of Benicia General Plan includes several goals and policies that are related to protecting people and property from potential or known geologic and seismic hazards. These policies are listed below.

Goal 4.11: Minimize harm from geologic hazards.

Program 4.11.A: Require geotechnical engineering reports to address site stability and building foundation integrity for projects involving substantial grading.

²³ Wieczorek, G.F., E.L. Harp, R.K. Mark, and A.K. Bhattacharyya, 1988. Debris Flows and Other Landslides in San Mateo, Santa Cruz, Contra Costa, Alameda, Napa, Solano, Sonoma, Lake, and Yolo Counties, and Factors Influencing Debris-flow Distribution, U.S. Geological Survey Professional Report 1434, pp. 133-162 + map (Plate 10).

²⁴ California Division of Mines and Geology (CDMG), 1987. Mineral Land Classification, Aggregate Materials, San Francisco-Monterey Bay Area, CDMG Special Report 146, Part III, 55 p.+ maps.



Source: Engeo, 1998

EXPLANATION

- A** Evidence of debris-flow activity was not observed on slopes in this area: includes most areas of nearly level and gently sloping terrain.
- B** Evidence of debris flows is uncommon but occurs locally. Only relatively few source hollows were noted on slopes within this area.
- C** Evidence of debris flows is relatively uncommon on the slopes or on aerial photographs of terrain within this area. Source hollows, swales, or slopes combined with appropriate source materials are relatively abundant and widespread within this area.



Areas not classified.

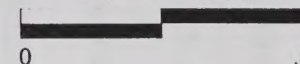


Project Boundary



NORTH

scale in miles



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Figure IV-B.4
Debris Flow Susceptibility

Program 4.11.C: Require peer review of geotechnical engineering reports if it is determined that City staff does not have the technical expertise to review such reports.

2. Impacts and Mitigation Measures

a. Thresholds of Significance. Unstable geologic environments can potentially result in significant damage to structures and/or cause injuries or fatalities to persons exposed to those hazards. For purposes of impact analysis for this EIR, a potentially significant impact would result if the Project would result in or expose people or structures to any of the following:

- Create direct geological impacts associated with inconsistencies with policies of the Benicia General Plan;
- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
- Strong seismic shaking;
- Seismic-related ground failure, including liquefaction;
- Landslides;
- Substantial soil erosion or the loss of topsoil;
- Geologic unit or soil that is unstable or that would become unstable as a result of the Project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse; or
- Expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

b. Less-than-Significant Impacts. The project area is in a portion of the City that the General Plan identifies as having potential landslide and debris flow hazards. The General Plan includes programs that require the preparation of geotechnical engineering reports for projects involving substantial grading, development of guidelines for such evaluations, and peer review of prepared reports. The Project would include significant construction grading (5 to 8 million cubic yards of cut and fill) and would be subject to the requirements for site-specific geotechnical, including development of guidelines and peer review, consistent with the General Plan. The City's policies related to mineral resource conservation do not apply to the project area location, as no significant mineral resources are present.

No known active faults cross the Master Plan Area, and therefore impacts associated with fault rupture would be less than significant. Erosion and loss of top soil during

grading activities is a potentially significant impact and is further discussed in the Hydrology and Water Quality section of this EIR. The remaining significance criteria are discussed below under Significant Impacts and Mitigation Measures.

c. Significant Impacts and Mitigation Measures.

Impact GEO-1: Damage caused by strong seismic shaking at the site during the expected earthquakes on regional faults could cause injuries and/or fatalities and structural and nonstructural damage to the proposed structures within the Master Plan Area. (S)

Seismic shaking at the site during the expected earthquakes on regional faults could cause structural and nonstructural damage to the proposed structures and other improvements within the Master Plan Area. Although the damage by seismic shaking to structures built in compliance with the CBC requirements for seismic design would not likely cause collapse of the structures, the damage could be extensive, comprising the structural integrity of buildings and could render them unusable. In addition, to potential structural damage, nonstructural damage should be expected. Nonstructural damage could include breakage of windows, doors, piping, ducts, and light fixtures, collapse of walls, partitions, ceilings, and stairways, or damage to contents (appliances, computer equipment, and furnishings).

The proposed Project includes substantial industrial and commercial development. During an earthquake, large numbers of people may be present at these facilities. Lack of adequate earthquake preparedness and implementation of evacuation plans may increase the potential for personal injuries and disorder.

Mitigation Measure GEO-1: The following mitigations to reduce the impacts of expected strong seismic shaking at the Master Plan Area shall be implemented:

- All structures shall be designed and constructed in conformance with the most recently adopted California Building Code requirements for seismic design.
- The applicant shall incorporate all recommendations of the geotechnical investigation (ENGEO, 1998) into the Project design.

The potential for damage during strong seismic shaking cannot be eliminated. A similar potential for seismically-induced damage affects most areas within the San Francisco Bay region that are located near major active faults. However, the proposed Project would draw a substantial number of people to an area of high seismic risk, exposing them to injury. The above mitigation measures would reduce, but not eliminate, the severity of impact

associated with seismic shaking. However, the risk of earthquakes and associated damage is generally accepted in the Bay Area and institutional controls such as the Benicia Emergency Response Plan, have been emplaced to reduce the risks to acceptable levels. (LTS)

Impact GEO-2: Damage to structures or property could occur at the Master Plan Area due to existing or induced slope instability resulting in landsliding.
(S)

The upland areas of the Project site include relatively steep slopes on which landslides have occurred. Construction of buildings or site improvements within or adjacent to landslides or slopes prone to landsliding could result in damage during new or continued slope movement. Reconnaissance of the Project site of the site has identified eight slope failures, typically consisting of shallow earthflows and slump-type failures.²⁵ During the expected very strong to very violent seismic shaking (particularly if the causative earthquake occurs during the rainy season when groundwater levels are high), the potential for slope failure is increased.

The preliminary geotechnical report (ENGEO, 1998) for the Project includes several recommendations for mitigating potential slope instability problems, including:

- When grading activities are conducted in identified landslide areas, the entire slide mass should be excavated to a level below the failure plane.
- Minimization of accumulation of water in the fill slopes (which could reduce slope stability) by installation of subdrains.
- Cut and fill slopes greater than 15 feet in height should be no steeper than 3:1; slopes up to 15 feet in height no greater than 2:1.
- All cut slopes should be inspected by the Engineering Geologist for conditions that may affect slope stability.
- Regular maintenance of debris benches below slopes, including removal of accumulated material that has migrated down the slope onto the bench.

Mitigation Measure GEO-2: Potential slope instability impacts associated with the proposed Project shall be mitigated by the following measures:

- The applicant shall incorporate all recommendations of the geotechnical investigation regarding mitigation of slope instability into the Project design.

²⁵ ENGEO, 1998. op. cit.

- All grading plans, cut and fill slopes, compaction procedures, and retaining structures shall be designed by a licensed professional engineer and inspected during construction by registered professional engineer (or representative) or Certified Engineering Geologist (or representative). All designs shall be submitted to, and approved by, the City of Benicia prior to implementation;
- The 40-scale grading plans, when prepared, shall be reviewed by a registered professional engineer, to ensure that the detailed plans conform with the intent of the preliminary geotechnical report.

Implementation of this mitigation measure would reduce potential impacts associated with slope instability to a to a less-than-significant level. (LTS)

Impact GEO-3: Potential long-term deformation related to construction of deep fills and potential failure of cut slopes could occur as a result of proposed development. (S)

The proposed construction of deep fills at the Master Plan Area (in some areas up to 50 feet in thickness) could result in the development of adverse soil conditions which could cause deformation of the fills. This deformation could affect the performance of foundations and other site improvements, including roadways and utility lines. Although the fills would be designed and constructed under the requirements of an approved grading plan, the potential for settlement of the fills and related subsidence of the land surface may occur in localized areas of the Project site. Minor settlement of properly constructed deep fills may be caused by primary compression which would typically occur soon after construction. However, over the last 10 years, investigation of settlement of old deep fills have raised a concern amongst geotechnical professionals regarding the long-term performance of these features.^{26,27} Older deep fills appear to be susceptible to a phenomenon typically referred to as “hydrocompression.” Under this process, the water content in soils within the deeper portions of the fills increases through time and, ultimately, the soil becomes saturated. The source of water has been attributed to overwatering of landscaped areas, leaking water conveyance structures, and collection of groundwater. When these deeper portions of the fill become saturated, the compacted soil can lose strength and experience consolidation. In many cases this process will not occur until more than 10 years after construction of the fill. This

²⁶ Brandon, T.L., M. Duncan, and W.S. Gardner, 1990. *Hydrocompaction Settlement of Deep Fills*, Journal of Geotechnical Engineering, Vol. 116, pp. 1536-1547.

²⁷ Rodgers, J.D., 1991. *Long Term Behavior of Urban Fill Embankments*, presented at the University of California-Berkeley Symposium on Foundation Conditions, July 1991, 16 p.

delayed consolidation can result in significant settlement of the ground surface. Such settlement can cause damage to improvements (structures, utilities, and pavements) which are constructed on the fills.

The preliminary geotechnical report for the Project includes several recommendations for mitigating potential problems associated with cut and fill, including:

- Remove colluvial material or weathered rock that may be subject to consolidation under the load of proposed fills.
- Minimize the variability of fill thickness within fills that underlie structures or other improvements at the Project site. When cut and fill transitions occur under build sites, additional excavation of cut areas should be conducted and backfilled with engineered fill to minimize fill thickness variability.
- Differential fill thicknesses should not exceed 15 percent.
- For slopes greater than 30 vertical feet in height, debris benches not less than 8 feet wide should be constructed, with concrete v-ditches to control surface water runoff.

Relatively high south-facing cut slopes along the northern portion of the site (in excess of 100 feet) would be required to accomplish the proposed grading plan. Each of the parcels within the site would benefit from the cut slopes (allowing gentler finished grades elsewhere at the site), but may unduly burden parcels adjacent to these features with slope failure risk and routine maintenance. The preliminary geotechnical report states that slope maintenance and clearing of v-ditches and debris benches would be required, but does not provide a mechanism for ensuring the maintenance. The City of Benicia would not accept maintenance responsibility for these slopes.

Mitigation Measure GEO-3: Potential impacts associated with cut and fill for the proposed Project shall be mitigated by the following measures:

- The applicant shall incorporate all recommendations of the Project geotechnical investigation (ENGEO, 1998) regarding mitigation of potential problems associated with cut and fill into the Project design.
- The applicant shall establish a self-perpetuating slope maintenance program (to be managed by a Master Plan Area business owners association or similar entity), that includes annual inspections of slopes, debris benches, and v-ditches. Any accumulation of slope detritus on the benches or in the v-ditches shall be promptly removed. The association would also be responsible for repair of

any slope failures that may occur on the cut slopes along the northern portion of the site. An annual report documenting the inspection and any remedial action conducted shall be submitted to the City of Benicia Public Works Department for review.

Implementation of this mitigation measure would reduce potential impacts associated with deformation of deep fills and maintenance of cut slopes to a to a less-than-significant level. (LTS)

Impact GEO-4: Damage to structures or property related to shrink-swell potential of Project soils could occur at the site. (S)

Many of the soils underlying the Project site have moderate to high shrink/swell potential. Shrinking and swelling occurs when expansive soils undergo alternate cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes significantly. Structural damage, warping, and cracking of roads and sidewalks, and rupture of utility lines may occur if the potential expansive soils were not corrected during design and construction of foundations and roads. On moderate to steep slopes, the expansive soils can exacerbate a process known as "soil creep." Under soil creep, the surface soil mantling the slope moves downslope very slowly. Although the movement is slow, structures on and within the soil can deform in response to the movement, resulting in tilted fences, cracked pavement or building foundations.

The preliminary geotechnical report for the Project (ENGEO, 1998) includes several recommendations for mitigating potential problems associated with expansive soils, including:

- Placement of moderate to highly expansive soils and bedrock at a depth of 15 feet below grade.
- Placement of low to moderately expansive materials within the upper 15 feet.
- Proper moisture condition and compaction of fill materials.
- Re-excavation, backfill, and compaction of materials used to fill test pits and trenches.
- Finished grades should provide a slope gradient of at least three to five percent to drain surface water away from structures.

Mitigation Measure GEO-4: Potential impacts associated with the moderate to high shrink-swell potential of soils within the proposed Master Plan Area shall be mitigated by the following mitigation measures:

- The applicant shall incorporate all recommendations of the Project geotechnical investigation (ENGEO, 1998) regarding mitigation of expansive soils into the Project design.
- Designs for all common landscaped areas shall incorporate low water-need plantings to minimize the potential for damage associated to pavements, utilities, and structures from expansive soils. The use of similar landscaping should be encouraged at individual parcels by providing information to new tenants regarding the relationship between irrigation and subsequent property damage. A document, describing the potential for damage from expansive soils from over irrigation and includes solutions such as drought-tolerant plant material and drip irrigation systems, shall be prepared by the applicant/owner and provided to all occupants of the proposed commercial and industrial facilities.

Implementation of this mitigation measure would reduce impacts associated with shrink-swell soils to a less-than-significant level. (LTS)

C. HYDROLOGY AND WATER QUALITY

■ ■ ■

This section describes the existing hydrological setting for the Project site, including runoff, drainage, and water quality, based on information available from the Project proponent, City staff, and previously prepared documentation. This section also identifies impacts that may result from Project development and suggests mitigation measures to reduce potential impacts.

1. Setting

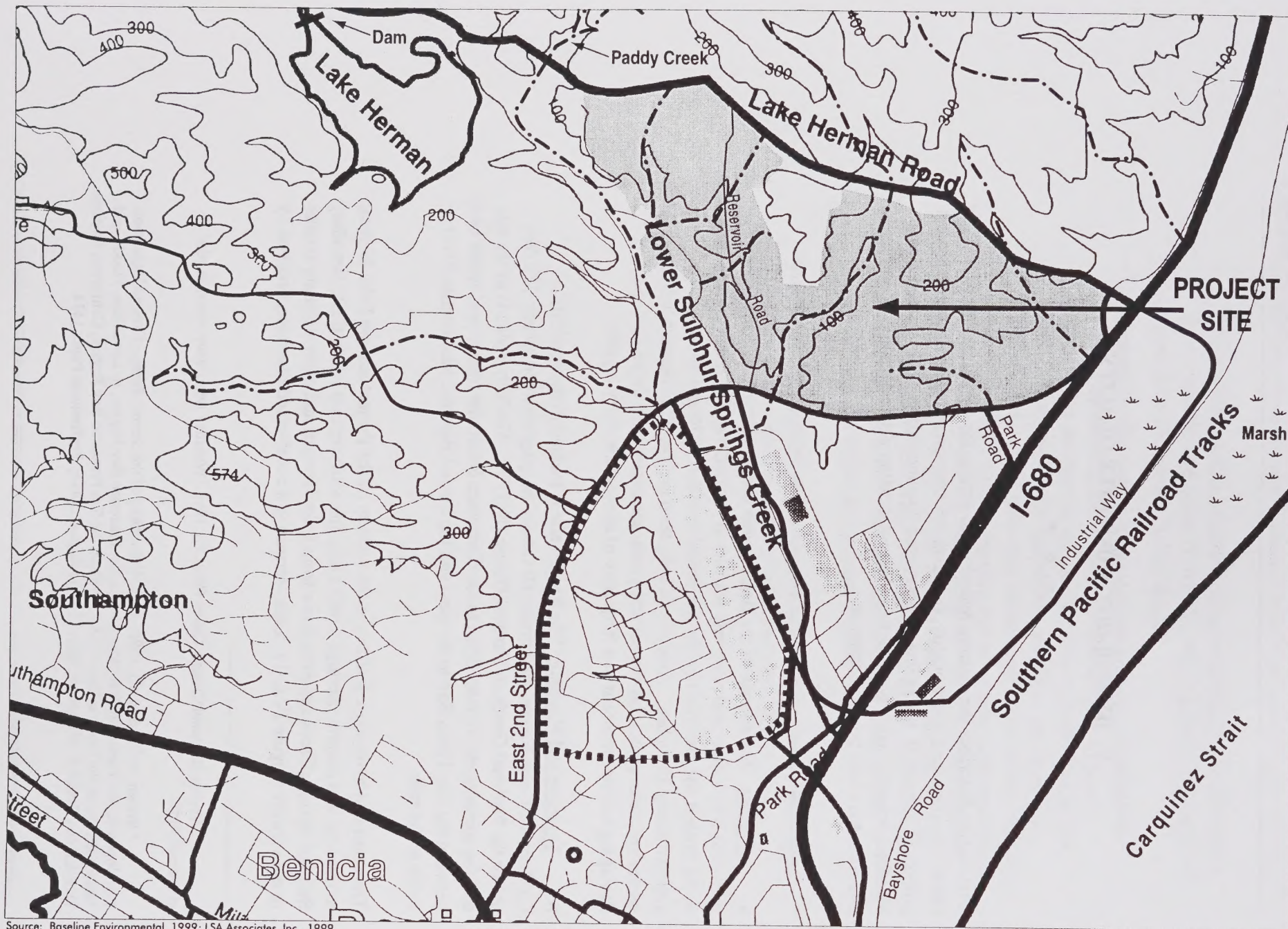
a. Climate. The climate of the Benicia area is characterized as Mediterranean with cool wet winters and relatively warmer dry summers. The mean annual rainfall in the Project site and vicinity, for the period between 1970 and 1998, is approximately 20 inches.¹ Analysis of long-term precipitation records indicates that wetter and drier cycles, lasting several years, are common in the region. Severe, damaging rainstorms occur at a frequency of about once every 3 years.²

b. Drainage and Flooding. The Project site is located in the foothills of California's Coast Range, with onsite elevations ranging between 30 and 280 feet above the National Geodetic Vertical Datum (NGVD). The hilly uplands of the site and the surrounding vicinity drain to the Carquinez Strait, the transitional water body between the San Pablo Bay to the west and the Suisun Bay and Sacramento River Delta to the east.

The dominant hydrologic features in the vicinity of the Project site are Lake Herman to the west and Sulphur Springs Creek along the southern and western site boundary. Sulphur Springs Creek receives flows from Lake Herman and other tributary creeks in the vicinity (Figure IV.C-1). Lake Herman is a constructed reservoir, retained by

¹ Western Regional Climate Center (WRCC), 1998. Website: <http://www.wrcc.dri.edu/elimsmsfo.html>.

² Brown, William M. III, 1988. Historical Setting of the Storm: Perspectives on Population, Development, and Damaging Rainstorms in the San Francisco Bay Region, in Landslides, Floods, and Marine Effects of the Storm of January 3-5, 1982, in the San Francisco Bay Region, California, Stephen D. Ellen and Gerald F. Wiczorek, Eds., U.S. Geological Survey Professional Paper 1434



Source: Baseline Environmental, 1999; LSA Associates, Inc., 1999.

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an earthen dam constructed in 1905, and used to supply raw (untreated) drinking water to the City of Benicia's water treatment plant. The storage capacity of the reservoir is 2,210 acre-feet.³ Lake Herman was formed by construction of the dam on Sulphur Springs Creek, which has a drainage area of 10.2 square miles above the dam. Below the dam at Lake Herman, Paddy Creek and several other unnamed tributaries flow into Lower Sulphur Springs Creek. Neither Paddy Creek nor Lower Sulphur Springs Creek cross the Project site (they merge near the northwest corner of the site and flow along the western boundary). Several of the unnamed tributaries, which originate in the hills north of the site, flow across the Project site in a general northwest to southeast direction. Some of the creeks may flow year round following particularly rainy winters, but most surface flows would be expected to dry up by mid to late summer in average rainfall years.

The Project site is not susceptible to regional flooding hazards, as mapped by FEMA.^{4,5} The Project site is not located within mapped dam failure inundation areas.⁶ Catastrophic failure of the dam retaining water at Lake Herman could result in inundation of a relatively small area downstream along Lower Sulphur Springs Creek, but would not affect the Project site. The elevation of the Project site (ranging from 30 to 280 feet above mean sea level) and distance from the coast preclude potential inundation by coastal hazards, such as tsunamis, extreme high tides, or sea level rise.

c. Water Quality. The quality of surface and groundwater in the Project site is affected by historic and current land uses in the vicinity and the composition of subsurface geologic materials. The Project site, which has been historically used for livestock grazing, is relatively undeveloped. Typical urban-type pollutants (i.e., petroleum hydrocarbons, heavy metals, pesticides) would not be expected to occur in significant concentrations in surface or groundwater from on-site sources. Typical pollutants associated with rangeland and livestock include excess sediment and nutrients (i.e., nitrate and phosphate), and these pollutants may occur in creeks in the area. No water quality data from the site were available.

³ Department of Water Resources, 1988. *Dams Within the Jurisdiction of the State of California*, Bulletin 17-88. October.

⁴ Federal Emergency Management Agency (FEMA), 1982. Flood Insurance Rate Map (FIRM), Solano County (Unincorporated Areas), California, Community Panel Numbers 060631 0625 B, 2. August.

⁵ Federal Emergency Management Agency (FEMA), 1989. Flood Insurance Rate Map (FIRM), City of Benicia, California, Map Index, Community Panel Numbers 060368 0001-0004. August 3.

⁶ Association of Bay Area Governments (ABAG), 1980. Map of Dam Failure Inundation Areas, San Francisco Bay Region. March.

Groundwater quality has been affected at the former IT Panoche Class I hazardous waste facility to the north of the Project site. However, surface and groundwater quality investigations conducted at IT under the direction of the California Department of Toxic Substances Control indicate that on-site releases have not impacted water quality at the Project site. For further discussion of the on-going water quality investigations and the regulatory status of the IT site, refer to Section D, Hazards, of this EIR.

The Project site is not located within a designated groundwater basin (as specified by the San Francisco Bay Regional Water Quality Control Board Basin Plan); the California Department of Water Resources has no groundwater level monitoring locations in the vicinity of the Project site,⁷ indicating that important regional groundwater supplies are not reasonably available in this area. While groundwater does occur in the geologic units underlying the site, it does not occur in quantities and/or yields that would allow for economically feasible extraction (and therefore, by definition, would not be considered to be underlain by "aquifers"). Use of groundwater underlying the Project site is not proposed as part of this Project.

d. Relevant Environmental Goals and Policies.

(1) Regional Water Quality Control Board. Water quality in surface and groundwater bodies is regulated by the State and Regional Water Quality Control boards. The Project site is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB), which is responsible for implementation of State and Federal water quality protection guidelines in the vicinity of the Project site. The RWQCB implements the Water Quality Control Plan (Basin Plan), a master policy document for managing water quality issues in the region. The Basin Plan⁸ establishes beneficial water uses for waterways and water bodies within the region. Since there are no major surface water bodies at the site and the site is not located within a designated groundwater basin, no specific beneficial uses have been designated for site surface water or groundwater.

Runoff water quality is regulated by the Federal National Pollution Discharge Elimination System (NPDES) Nonpoint Source Program (established through the Clean Water Act); the NPDES program objective is to control and reduce pollutants to water bodies from nonpoint discharges. The Program is administered by the

⁷ California Department of Water Resources (DWR), 1994. Historical Ground Water Levels in Solano County. March.

⁸ San Francisco Bay Regional Water Quality Control Board, 1995. Water Quality Control Plan. June 21.

RWQCBs. Planned development within the Project site would be under the jurisdiction of the San Francisco Bay RWQCB.

Projects disturbing more than 5 acres of land during construction are required to file a Notice of Intent (NOI) with the RWQCB to be covered under the State NPDES General Construction Permit for discharges of storm water associated with construction activity. A developer must propose control measures that are consistent with the State General Permit. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and implemented for each site covered by the general permit. A SWPPP should include Best Management Practices (BMPs) designed to reduce potential impacts to surface water quality through the construction and life of the Project. The City of Benicia, Public Works Department would review the SWPPP (to be submitted with Project grading plans) and conduct site inspections of grading activities to ensure the SWPPP is being properly implemented.

(2) City of Benicia. The City of Benicia General Plan contains several goals and policies relevant to hydrology and water quality. These policies are listed below.

Policy 3.22.1: Avoid development that will degrade existing lakes and streams.

Program 3.22B: Require a minimum setback of 25 feet from the top of the bank of streams and ravines. Do not allow development within the setback.

Goal 4.12: Accommodate runoff from existing and future development.

Policy 4.12.1: Regulate runoff from new development so that post-development site peak flow rates are no greater than pre-development levels.

Policy 4.12.2: Upgrade existing drainage facilities as necessary to correct localized drainage problems.

Policy 4.12.3: Ensure that new development pays its fair share cost of drainage system improvements.

Policy 4.12.4: Where practicable, discourage the use of storm drain systems, and promote stormwater management strategies which maximize opportunities for absorption of rainfall, overland conveyance of runoff, non-reservoir surface storage, and other measures that reduce development-induced impacts on peak flow rates.

Goal 4.13: Prevent property damage caused by flooding.

Policy 4.13.2: Promote non-structural solutions to flood problems, where feasible.

Program 4.13.B: Where appropriate, promote the use of stormwater retention basins rather than standard engineering modifications to natural channels.

Goal 4.14: Prevent ground and surface water contamination.

Policy 4.14.1: Implement non-point source pollution strategies.

Program 4.14.C: Provide information to the public on provisions of the City's Stormwater Pollution Prevention Plan (SWPPP) program and preparation of SWPPPs for all construction projects of 5 acres or more. Implement Best Management Practices (BMPs) for stormwater runoff and erosion controls for all development.

2. Impacts and Mitigation Measures

a. Thresholds of Significance. The proposed Project would have a significant impact on hydrology, drainage, or water quality if it would:

- Create direct hydrology impacts related to inconsistency with policies from the Benicia General Plan;
- Cause substantial flooding or erosion;
- Adversely affect any significant water body;
- Expose people to reasonably foreseeable hydrologic hazards, such as flooding or tsunamis (using the 100-year recurrence interval for floodplains, tsunami runup, and tidal flood hazards);
- Adversely affect surface or groundwater quality or quantity;
- Violate any water quality standards or waste discharge standards or otherwise substantially degrade water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- Substantially reduce the amount or quality of water otherwise available for public water supplies;

- Substantially alter drainage patterns, currents, or the course or direction of water movements, in a manner that would result in substantial erosion or siltation on- or off- site, or substantially increase the rate or amount of surface water runoff in a manner that would result in flooding on or off-site;
- Create or substantially contribute to runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or
- Alter the course or flow of flood waters.

b. Less-than-Significant Impacts. The General Plan requires continued compliance with NPDES requirements, including implementation of BMPs and the SWPPP. The General Plan recommends avoiding development that would degrade water quality in existing lakes and streams, and requires a minimum setback of 25 feet from the top of bank of streams and rivers. See discussion below under Impact 3 related to alteration of on-site stream channels.

There are no flood hazard zones in the vicinity of the Project site; however, the Project could contribute to flooding problems downstream of the site, which is discussed below under Significant Impacts and Mitigation Measures. The General Plan encourages the use of storm water retention basins rather than engineering modifications to natural channels. Although the proposed project does not currently include provisions for individual lot development, stormwater detention basins could be included in individual development proposals.

The Project is not expected to be susceptible to regional flood hazards since it is entirely located outside the 100-year flood hazard zone, nor would the Project alter the course of flood waters. The Project site is not adjacent to the coastline and therefore coastal hazards, such as extreme high tides, tsunamis, or sea level rise would not represent significant impacts. The Project site is not underlain by recognized groundwater aquifers and no recharge facilities exist in the area, therefore the Project would not result in impacts to aquifer volume or public water supplies. The remaining thresholds of significance listed above are discussed below under Significant Impacts and Mitigation Measures.

c. Significant Impacts and Mitigation Measures. This section describes the Project impacts associated with modifications to storm drainage, including potential increases in peak runoff volume, and potential water quality impact associated with construction and operation-period activities.

Impact HYDRO-1: Creation of new impervious surfaces could result in increased runoff volume from the site, potentially causing impacts on downstream flooding. (S)

The proposed Project would increase impervious surfaces and modify drainage patterns, which could alter runoff volumes and velocities, at and downstream of the Project site. Portions of the existing storm water conveyance system downstream of the Project site are already at capacity, and any increase in peak runoff volumes to these conveyances associated with new development would be considered a significant impact.⁹

Preliminary hydraulic analyses of proposed Project has been completed by the applicant's engineering consultant ¹⁰ using the methodology designated by Solano County Hydrology Manual. The analysis was conducted to determine whether any "fatal flaws" regarding drainage issues may occur, and was not intended as a final detailed hydraulic analysis.¹¹ Design-level hydraulic analysis would be conducted subsequent to environmental review.

The analysis compares existing conditions to proposed development conditions. The Project site (and off-site catchment areas) was divided into drainage subareas, and the peak runoff volumes expected during the design storm (the 10-year, 24-hour storm) were calculated for each subarea under existing conditions and under proposed conditions. Detention basins, proposed as part of the Master Plan, that would be used to reduce peak runoff volumes from subareas 1, 2, 3, 4, were included in the analysis of proposed conditions. Modeling indicated that almost the entire design storm would be detained in subarea 1, and that reductions to peak flows would occur at subareas 2 through 4. Slight increases in peak discharge would occur from drainage subareas 7 and 8, as no detention facilities were specified; however, based on preliminary review of downstream components, the hydraulic analysis concludes that adequate conveyance capacity is available to accommodate the increase.¹² The analysis does not calculate runoff volumes for the relatively small subareas 5 and 6 (5 and 8 acres, respectively).

⁹ Throne, Michael, 1999. Senior Civil Engineer, City of Benicia, personal communication with Bruce Abelli-Amen of BASELINE. June 21.

¹⁰ Water Resources Consulting Services, 1998. Hydrologic Analysis, Benicia Business Park, Benicia, California. January 16.

¹¹ Henry, Roger, 1999. Morton and Pitalo, Inc. (civil engineering/planning firm for the applicant), personal communication with Bruce Abelli-Amen of BASELINE. August 31.

¹² Ibid.

The preliminary hydraulic analysis indicates that the increase in peak runoff volumes can be adequately retained within the Project site. However, sufficient detail regarding net effects on downstream conveyances has not been provided (i.e., discharges are decreased in some subareas and increased in others). The potential for an increase in peak runoff volumes from the proposed Project represents a significant impact.

Mitigation Measure HYDRO-1: As a condition of approval of the final grading and drainage plans for the Project, detailed hydraulic analysis shall demonstrate that implementation of the proposed drainage plans would:

- Not increase peak runoff rates from any subareas, or that there is no increase in combined peak runoff volumes from subareas draining to the same downstream conveyance component (i.e., reductions in one subarea can offset increases in another subarea, if they drain to the same downstream conveyance), or that the downstream conveyance has adequate capacity to handle the proposed increase. The final drainage plan for the Project shall be prepared by a licensed professional engineer;
- Include drainage components that are designed in compliance with City of Benicia standards. The grading and drainage plans shall be reviewed for compliance with these requirements by the City of Benicia Department of Public Works. Any improvements deemed necessary by the City, shall be part of the conditions of approval; and
- The applicant shall establish a self-perpetuating drainage system maintenance program (to be managed by a Project site business owners association or similar entity), that includes annual inspections of sedimentation basins, drainage ditches, and drainage inlets. Any accumulation of sediment or other debris shall be promptly removed, at the expense of the business owners' association. An annual report documenting the inspection and any remedial action conducted shall be submitted to the City of Benicia Public Works Department for review.

Implementation of this mitigation measure would reduce potential impacts associated with increased peak runoff volumes to a to a less-than-significant level. (LTS)

Impact HYDRO-2: Construction activities and post-construction site uses could result in degradation of water quality in creeks and the Carquinez Strait by reducing the quality of storm water runoff. (S)

(3) Construction-Related Water Quality Impacts. Construction and grading within the Project site would require temporary disturbance of surface soils and removal of existing cover. During the construction period, grading and excavation activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. Soil stockpiles and excavated parcels at the Project site would be exposed to runoff and, if not managed properly, the runoff could cause erosion and increased sedimentation the creek and downstream conveyances. The accumulation of sediment could result in blockage of flows, potentially resulting in increased localized ponding or flooding.

The potential for chemical releases related to heavy equipment operation is present at most construction sites. Once released, substances, such as fuels, oils, paints, and solvents could be transported to surface water and/or groundwater in storm water runoff, wash water, and dust control water, potentially reducing the quality of the receiving waters. The potential for impacts to water quality during construction of the proposed Project represents a potentially significant impact.

(4) Operation Period Water Quality Impacts. New construction and intensified land uses at the Project site would result in increased vehicle use and industrial/ commercial uses and potential discharge of associated pollutants. Leaks of fuel or lubricants, tire wear, and fallout from exhaust contribute petroleum hydrocarbons, heavy metals, and sediment to the pollutant load in runoff being transported to receiving waters. Runoff from common landscaped areas may contain residual agricultural chemicals, including pesticides and nutrients. Long-term degradation of water quality runoff from the site could impact the quality of surface water runoff and the Carquinez Strait. The applicant has not specified any particular measures to be included in the Project to mitigate operation-period water quality impacts.

Mitigation Measure HYDRO-2: Prior to issuance of a grading permit, the applicant shall prepare a SWPPP designed to reduce potential impacts to surface water quality through the construction and life of the Project. The SWPPP would serve as the overall program document designed to provide measures to mitigate potential water quality impacts associated with implementation of the proposed Project. The SWPPP shall include:

1. **Specific and detailed BMPs designed to mitigate construction-related pollutants.** These controls shall include practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, adhesives) with storm water. The SWPPP shall specify properly

designed centralized storage areas that keep these materials out of the rain.

An important component of the storm water quality protection effort is the understanding of the site supervisors and workers about water quality impacts. To educate on-site personnel and maintain awareness of the importance of storm water quality protection, site supervisors shall conduct regular tailgate meetings to discuss pollution prevention. The frequency of the meetings and required personnel attendance list shall be specified in the SWPPP.

The SWPPP shall specify a monitoring program to be implemented by the construction site supervisor, and must include both dry and wet weather inspections. City of Benicia personnel shall conduct regular inspections to ensure compliance with the SWPPP. RWQCB personnel, who may make unannounced site inspections, are empowered to levy considerable fines if it is determined that the SWPPP has not been properly prepared and implemented.

BMPs designed to reduce erosion of exposed soil may include, but are not limited to: soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales, and sediment basins. The potential for erosion is generally increased if grading is performed during the rainy season as disturbed soil can be exposed to rainfall and storm runoff. If grading must be conducted during the rainy season, the primary BMPs selected shall focus on erosion control, that is, keeping sediment on the site. End-of-pipe sediment control measures (e.g., basins and traps) shall be used only as secondary measures. If hydroseeding is selected as the primary soil stabilization method, then these areas shall be seeded by September 1 and irrigated to ensure that adequate root development has occurred prior to October 1. Entry and egress from the construction site shall be carefully controlled to minimize off-site tracking of sediment. Vehicle and equipment wash-down facilities shall be designed to be accessible and functional both during dry and wet conditions.

2. **Measures designed to mitigate post construction-related pollutants.** The SWPPP shall include measures designed to mitigate potential water quality degradation of runoff from all portions of the completed development. The specific BMPs that would be required of a project can be found in *San Francisco Bay Regional Water*

Quality Control Board Staff Recommendations for New and Redevelopment Controls for Storm Water Programs (April, 1994). The selection of BMPs required for a specific project is based on the size of the development and the sensitivity of the area. In general, areas near surface waters (i.e., creeks, lakes, or the Bay) are considered sensitive areas by RWQCB. Passive, low-maintenance BMPs (e.g., grassy swales, porous pavements) are preferred. If the SWPPP includes higher maintenance BMPs (e.g., sedimentation basins, fossil filters), then funding for long-term maintenance needs must be specified (the City will not assume maintenance responsibilities for these facilities).

In addition, some of the individual industrial businesses (depending on the type of activity) which operate at the Project site may be subject to regulation under the General Industrial Activities Storm Water Permit administered by the Regional Water Quality Control Board. These businesses would be required to file a Notice of Intent to comply with General Permit, conduct site inspections, collect runoff samples, and file annual reports.

3. **Integrated Pest Management Plan.** The applicant shall develop and implement an Integrated Pest Management Plan (IPM) for all common landscaped area, if any. The IPM shall be prepared by a qualified professional approved by the City. The IPM shall address and recommend methods of pest prevention and plant management that use pesticides as a last resort in pest control. Types and rates of fertilizer and pesticide application shall be specified. Special attention in the IPM shall be directed toward avoiding runoff of pesticides and nitrates into creeks, wetland mitigation areas, or leaching into the shallow groundwater table. **Pesticides shall be used only in response to a persistent pest problem.** Preventative chemical use shall not be employed. Institutional and biological approaches to pest control shall be fully integrated into the IPM with an emphasis toward reducing pesticide application.

The City of Benicia Public Works Department shall review the SWPPP to ensure that the selected BMPs meet the intent of the General Permit. Implementation of this mitigation measure would reduce potential water quality impacts to a less-than-significant level. (LTS)

Impact HYDRO-3: Proposed grading at the site will substantially alter surface water drainage patterns, placing several of the on-site creeks and/or drainage swales in buried culverts, potentially reducing the natural ability of the creek system to treat pollutants. (S)

Extensive grading proposed at the Project site would drastically alter the condition of existing unnamed creeks crossing the site, in many cases eliminating the creeks and placing the drainage in buried storm drainage pipes. From a hydraulic efficiency perspective, as long as the drainage system is adequate sized and constructed (refer to Mitigation Measure HYDRO-1), there should be no hydrological impact (e.g., flooding or erosion). The primary impact associated with culverting creeks is associated with loss of biotic habitat. Impacts and mitigation measures related to potential loss of biological resources is presented in the Biological Resources section of this EIR. In addition, the proposed Project would not be in conformance with the General Plan policies regarding grading and construction setbacks of 25 feet from water bodies (creeks).

Culverting creeks can result in secondary impacts to water quality by reducing the natural filtering capacity of the system by replacing creeks with buried pipes. Pollutants contained in water flowing in creeks are subject to a variety of processes that provide some level of treatment, including photodegradation (from exposure to sunlight), physical filtering, biological assimilation, and volatilization. These processes are generally absent in buried pipes, because water flowing in pipes is not exposed to light, does not pass through a filter medium, and typically would not contain a significant biological component. In addition, residence time of the water is important to enhancement of water quality. Water in pipes flows quickly and efficiently, allowing little time for settlement of sediments and associated pollutants. Water in creeks flows much slower, allowing the physical processes to provide some level of pollutant reduction.

The Project includes the installation of nine wetland mitigation areas.¹³ The detention basins and wetlands would be designed to contain all water flowing onto the site from upstream off-site creeks. These wetland systems would be designed to receive only low flows. Higher flows would first pass through a detention basin where sediment would be allowed to settle out before being direct to the wetlands or storm water conveyance system. The preliminary design does not direct surface water runoff from the Project site to the wetland mitigation features,¹⁴ and therefore

¹³ Sycamore Associates, LLC, 1999. Draft Preliminary Discussion of Wetland Mitigation at the Benicia Industrial Project, written communication to Bruce Abell-Amen of BASELINE. August 26.

¹⁴ Wood, Michael, 1999. Sycamore Associates, LLC, personal communication with Bruce Abell-Amen of BASELINE. August 31.

would not provide treatment of on-site storm water runoff. The Project design does not include specific Best Management Practices to mitigate potential impact to water quality resulting from elimination of the much of the natural drainages within the Project site.

Mitigation Measure HYDRO-3: Potential impacts to water quality can be adequately mitigated with a properly designed and implemented Storm Water Pollution Prevention Plan (SWPPP). Mitigation Measure HYDRO-2 requires the implementation of SWPPP. (LTS)

D. HAZARDS AND HAZARDOUS MATERIALS

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The purpose of this section is to examine the potential for impacts to public health and safety posed by hazards and hazardous materials within the Project site or from immediate off-site land uses. Implementation of the proposed Project may cause a temporary and permanent increase in hazardous materials use during Project site development and operations, expose demolition workers to hazardous building materials or other hazards, expose additional people or structures to grassland areas subject to fire hazards, or impact an adopted emergency response plan or emergency evacuation plan. These issues are addressed in the following impact analysis. Water quality issues that do not pose a direct potential for public health and safety impacts, but still have the potential to significantly affect water quality, are addressed in Section C, Hydrology and Water Quality, of this EIR.

1. Setting

The proposed Project includes subdivision of the Project site and future development of industrial and commercial uses and would result in construction of approximately 4,094,000 square feet of industrial buildings for manufacturing, assembly, and packaging of goods and products, and wholesale, distribution and storage facilities. Approximately 490,000 square feet of commercial buildings would also be constructed; these commercial uses would likely be similar to existing types of nearby commercial facilities (described below under Current Land Uses and Site Reconnaissance). Development would also include construction of the necessary infrastructure including roadways, water, sewer, and utilities, and installation of two water tanks that would provide water supply for the proposed development. Prior to grading and development, several existing structures located in the western portion of the site, possibly used for previously for farming, would be demolished.

a. Current Land Uses and Site Reconnaissance. A site reconnaissance was conducted in June 1999 for the purpose of identifying current land uses and the presence of any hazardous materials within the Project site or on adjacent sites. Observations of the Project site were made from those areas of the site accessible by vehicle. Observations related to the potential presence of hazardous materials are described below.

Three structures were observed in the northwestern portion of the Project site. One of these structures appeared to be a barn, while the other two structures may have been used for farming operations and a residence. The barn appeared to have been constructed with a corrugated metal roof with a wooden exterior. At least one of the structures appeared to have peeling paint on the building exterior. In the northern portion of the property, one 55-gallon drum was observed to be stored on its side, just south of Lake Herman Road. The drum was rusty and appeared to be damaged; the label on the drum could not be read. The contents of the drum, if any, did not appear to be leaking. No other hazardous or potentially hazardous materials were observed on the site during the site visit.

An unpainted single-story cement and wood structure was also observed in the southeastern portion of the Project site, as viewed from Industrial Way.

Off-site land uses include the former hazardous waste landfill owned by International Technology (IT) and the Benicia Water Treatment Plant in the north; an existing commercial area including a restaurant and gasoline station to the northeast; light industrial/commercial land uses to the east and south; including an Exxon refinery; and the former Benicia Arsenal Tourtelot property to the southwest. South of Industrial Way, and outside the Project site, a high voltage overhead line follows Industrial Way to the west. Other land uses include Lake Herman and open space to the west of the Project site.

b. Hazardous Materials Releases.

(1) On-Site. A review of previous available environmental investigations and regulatory agency records of hazardous materials releases for the Project site and within 1 mile of the area¹ was conducted to identify potential on-site and off-site hazardous materials uses. The regulatory agency records review included hazardous materials releases as defined by Government Code Section 65962.5. In addition, aerial photographs from for the Project site for 1937, 1965 and 1970² were reviewed for land uses that could have potential hazardous materials uses.

No previous hazardous materials releases were identified for the Project site in regulatory agency records or in the aerial photographs reviewed, although only the eastern portion of the Master Plan area was included in the photographs reviewed.

¹ Environmental Data Resources (EDR), 1999a. EDR-Radius Map with GeoCheck, Benicia Business Park, property bounded by Lake Herman Road, E. Second Street, and Industrial Way, Benicia, California. May 27.

² EDR, 1999b. The EDR-Aerial Photography Print Service, Benicia Business Park, property bounded by Lake Herman Road, E. Second Street, Industrial Way, Benicia, California. June 2.

The western portion of the Project site was within the former Benicia Arsenal boundary Revetment Area. This portion of the Project site for the former Benicia Arsenal was indicated as property that was leased by the Benicia Arsenal. The former Benicia Arsenal was used by the U.S. Army from 1849 to 1960 as a principal depot for ordnance storage and issuance (e.g., supplies, ammunition, small arms parts and accessories), and the manufacture of small arms, mobile and seacoast artillery targets.³

The revetment area within the former arsenal was an explosives holding yard. The area was designed to control or contain any damage from explosions, and its features included seven railroad spurs, a perimeter road around the railroad tracks, burn cages, and drainage channels. Ammunition was piled throughout the revetment area during 1946 to 1947. According to eye witness accounts from former arsenal employees, a fire burned in the revetment area during this period. The 12-hour long fire exploded countless rounds of 0.50 caliber ammunition and scattered shell casings through the revetment area.⁴

One report of previous Department of Defense clearance activities at the arsenal revetment area was identified. This report indicated that this area was cleared in 1955. However, during a later inspection of the area in 1955, several unexploded ordnance (UXO) items were found, and it was recommended that a clearance be performed in the area. No record of a possible second clearance was found in records reviewed.⁵

The Arsenal was declared as excess property by the Department of Defense in 1963 and was vacated. In February 1975, the City of Benicia leased a majority of the property to Benicia Industries, a private land development firm for development. The former Benicia Arsenal site is currently used for residential housing, light to heavy industry, warehousing, commercial business, and still functions as a port. A significant portion of the former arsenal site remains undeveloped.⁶

³ U.S. Army Corps of Engineers (Corps), Sacramento District, 1998. Arsenal-Wide: Environmental evaluation for the Benicia Arsenal. October

⁴ Jacobs Engineering, 1999. As cited in Earth Technology (Earth Tech), 1999, Draft Engineering Evaluation/Cost Analysis, Former Benicia Arsenal, Solano County, California, prepared for U.S. Army Engineering and Support Center, Huntsville, AL, and U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA. June.

⁵ Earth Tech, 1999. Op. cit.

⁶ Corps, 1998. Op. cit.

In August 1995, the Benicia Arsenal was identified by the Sacramento District U.S. Army Corps of Engineers (Corps) as a potential site for explosive and hazardous materials investigations as soon as funding was available. Sampling was conducted by Earth Technology (Earth Tech) in 1999 within and near the western portion of the Project site, and other locations within the former Benicia Arsenal, for the presence of ordnance and explosives (OE), OE scrap, and UXO ^{7,8} OE and UXO are identified as hazardous. OE scrap includes those items that are fragments of functioned ordnance, and that contain no explosive or other items of a dangerous nature. The rationale for selecting boundaries of different study areas within the former Benicia Arsenal was based on different prior, current, or potential future land use than the surrounding property, in addition to specific past Department of Defense activities such as demolition operations or test firing of artillery rounds.

Areas investigated within the Project site were designated as located within Sector 1 of the Earth Technology investigation, although some areas just outside the proposed Project area were also located in Sector 1. The primary purpose of sampling of Sector 1 was to determine if any munitions had been distributed over the area from explosions that may have occurred from munitions destroyed in a 1946/1947 fire within the revetment area, and 0.50 caliber rounds that may have been stored in railcars that may have burned in the 1946/1947 fire.

The field investigation was conducted in two phases. The first phase included performing a geophysical investigation to detect and map metallic objects that could be OE scrap or OE/UXO. Within each sector, a series of grids (100 by 100-foot areas) were randomly placed using statistical approaches and the geophysical surveying was performed. Some grids were strategically placed in order to avoid structural features (e.g., buildings, roads, fences, and paved areas), steep terrain, potential sensitive habitat areas, others were placed to include past land uses where OE were used.⁹

The second phase of the field investigation involved surface sampling of the grids where geophysical surveying indicated subsurface anomalies. Items recovered were classified as UXO, OE, OE-scrap or non-OE scrap. During subsurface sampling of Sector 1, a total of 660 anomalies were identified of which 404 (61 percent) were

⁷ Corps, GIS maps reviewed by Internet, August 30, 1999.

⁸ Earth Tech, 1999. Op. cit.

⁹ Within the entire Sector 1, 32 grids totaling 7.35 acres were randomly placed throughout the sector. During the field investigation, 7 of the 32 grids were not able to be sampled for OE because right of entry could not be granted, an additional grid was unable to be sampled due to steep terrain. In total, 24 grids were sampled for OE in Sector 1, encompassing 5.52 acres of the 68 acre area.

intensively investigated. Of this 380 (94 percent) were classified as non-OE scrap, and 24 (6 percent) were classified as false positives (nothing was found). There was no OE scrap, UXO, or OE recovered in Sector 1 during this investigation. In addition, no 0.50-caliber rounds (which do not contain explosives) were recovered during subsurface sampling of the area.

Based on the results of this field investigation, no Department of Defense Actions were recommended for Sector 1 under current or anticipated future land use (future land use for Sector 1 was assumed to be limited industrial). A surface or subsurface OE/UXO clearance would therefore not occur.

In addition to the investigation described above, the Corps is also currently investigating and identifying potential hazardous, toxic, and radioactive waste sites at the former Benicia Arsenal. This area includes areas within the western portion of the Project site. The initial investigation will include archival searches, on-site investigations, interviews, and collection of soil and groundwater samples. If evidence of these materials is found to be associated with past Department of Defense usage, plans will be initiated for proper remediation in accordance with local, State, and Federal requirements.¹⁰ To date no hazardous materials uses of the Project site have been identified by the Corps.^{11,12} Some rail spurs for the revetment area may, however, have been located within the western portion of the Project site or immediately adjacent to it. Also, a portion of an area identified as the David Property may have been within the proposed Project area and/or immediately adjacent to it. During inspection of former arsenal properties by the Corps, the inspection team was not able to contact the David property owner, but "nothing of concern" was evident during an assessment of the periphery of the property, as observed by the Corps. Most of the David Property was observed to be occupied with industrial buildings and parking area. An unimproved portion of the David property was also used by a construction company for staging and storage.¹³

(2) Off-Site. Many land uses in the Project vicinity are currently or have historically used, stored, generated, and disposed of hazardous materials. If releases of hazardous materials had occurred from these sites, there could be a potential for

¹⁰ Corps, 1998. Op. cit.

¹¹ Corps, 1998. Op. cit.

¹² Two sets of structures were identified in geographic information maps based on site surveys conducted in 1999 by the Corps for the Project site; however, these structures corresponded to the farm structures observed from Lake Herman Road (see above) and structures at the Benicia Water Treatment Plant. CAD and GIS maps reviewed for the Benicia Arsenal on the Internet, August 30, 1999.

¹³ Corps, 1998. Op. cit.

the releases to migrate and affect soil, groundwater and/or any surface water within the Project site. The primary transport mechanisms for migration of contaminants would be via shallow groundwater, surface water, or deposition of airborne contaminants on surface soils. Releases of hazardous materials to air could also potentially expose any humans within the Project site.

The local groundwater and surface water flow direction is presumed to be toward the south, based on regional topography. Prevailing winds are influenced by local topography and time of day, but are generally westerly. Therefore, sites with releases of hazardous materials affecting groundwater or surface water north of the Project site, and sites emitting airborne contaminants northwest to southwest of the Project site, could potentially release hazardous materials that could affect soil, groundwater, air, and/or any surface water conditions at the site. The site could be affected by airborne contaminants from sources located east of the site if unusual wind patterns were present.

Several sites within 1 mile of the Project site are listed on regulatory agency lists as having known or suspected releases of hazardous materials. Those sites with reported unremediated releases of hazardous materials are listed on Table IV.D-1. Based on their location and the type of potential releases, releases from two of these sites, the IT Corporation Panoche Facility, and Exxon, were determined to have the potential to affect surface and subsurface conditions within the Project site and are described in detail below. The nearby Tourtelot property at the former Benicia Arsenal is also undergoing investigation for hazardous materials, including unexploded ordnance, and is described below. The City of Benicia Water Treatment Plant stores hazardous materials that could be released into the air, and is also described.

(a) *IT Corporation Panoche Facility.* The IT Corporation Panoche facility, located more than 3,000 feet north¹⁴ of Lake Herman Road, was a Class I hazardous waste disposal facility, which operated north of the Project site from 1968 to 1986. While in operation, an estimated 80,000 to 200,000 tons of hazardous

¹⁴ The greater than 3,000-foot distance between the nearest boundary of IT facility and the Benicia Business Park proposed site is in excess of a 2,000-foot required buffer zone. [The Hazardous Waste Property and Border Zone Property Law (California Health and Safety Code, Article 11, Section 25220 through 25241) requires a property owner who is proposing to build residential buildings, a school, a hospital, and/or a day care facility within 2,000 feet of a significant disposal of hazardous waste to apply for determination from DTSC regarding whether the property should be designated a Border Zone Property or a Hazardous Waste Property. The proposed project exceeds the requirements for residential development (which are generally more conservative than requirements for commercial/industrial development), and therefore would be considered to be in compliance with the Border Zone Property Law.]

**Table IV.D-1
REPORTED AND SUSPECTED RELEASES OF
HAZARDOUS MATERIALS WITHIN THE PROJECT VICINITY**

Site Name/Address	List	Location	Site Status
Bay Area Diablo Petroleum Co. 115/116 W. Channel Road	LUST	Assumed to be downgradient of Project site (groundwater)	Release of diesel reported in 1992 has affected groundwater; remediation underway.
IT Corporation Benicia Facility Lake Herman Road	CORRACTS	Assumed to be upgradient of Project site (groundwater or surface water)	31 hazardous waste violations reported at site between 1987 and 1995. Various contaminants, including volatile organic compounds and metals have affected groundwater at the Project site.
Exxon 3410 E. 2nd Street	LUST, CalSites, CHMIRS	Assumed to be downgradient of Project site (groundwater); upgradient of Project site for air emissions	Several releases of gasoline and oil have been reported; soil and groundwater has been affected.
473 E. Channel Road	CHMIRS	Assumed to be downgradient (groundwater)	Release of 400 gallons of paint wash water reported in 1990.
Insured Transporters Inc. 100 Industrial Way	LUST	Assumed to be downgradient (groundwater)	Release of gasoline and diesel reported in 1990 has affected groundwater; assessment of the release is underway.

Notes: Only documented, unremediated releases of hazardous materials within 1 mile of the Project site are listed in the table.
Cal-Sites = State list of suspected hazardous materials sites.
CHMIRS = California Hazardous Material Incident Reporting System database of hazardous material incidents.
CORRACTS = Federal database of sites with hazardous waste violations.
LUST = Regional Water Quality Board list of leaking underground storage tank sites.

Source: EDR, 1999a, op. cit.

waste were disposed annually.¹⁵ The former hazardous waste landfill is currently undergoing closure with the California Department of Toxic Substances Control (DTSC) as the lead agency. It is expected that closure requirements will have been satisfied in the year 2001.¹⁶

¹⁵ Jones & Stokes, 1996. Op. cit.

¹⁶ Lecler, Ray, DTSC, 1999. *Personal communication* with W. Scott of BASELINE Environmental Consulting. August 19.

A number of contaminants, including volatile organic compounds, semi-volatile organic compounds, metals, and chlorides have been identified in ground and surface water at and near the IT Site.¹⁷ Since 1986, all liquid waste impoundments at the IT site have been solidified and temporary soil covers have been placed over all waste units. A slurry wall has been installed and keyed into bedrock to help prevent off-site migration of contaminants in groundwater. Groundwater extraction wells have also been installed and operated on portions of the IT site to prevent further groundwater and subsequent surface water contamination.

Two drainages that originate at the IT facility either pass through or near the Project site: the "Entrance Road Drainage" (flowing due south from the IT facility) and the "Paddy Creek Drainage" (flowing southwest then southeast from the IT facility). It is possible that significant releases at the headwaters of these drainages at the IT facility could eventually affect the Project site by subsurface migration of contaminants in groundwater flow. None of the other drainages originating at the IT facility pass through or near the project site.

Groundwater and surface water at and near the IT facility is monitored periodically to identify and monitor contaminants potentially migrating off-site in accordance with Waste Discharge Requirement Order No. 98-091 by the San Francisco Regional Water Quality Control Board (RWQCB) (enforced by DTSC).¹⁸ Sampling from the nearest monitoring well to the Project site (well MW-84 located in the Entrance Road Drainage)¹⁹ has shown chlorides and total dissolved solids (TDS) at concentrations significantly higher than background levels; sampling since 1996 has shown these concentrations to be steadily decreasing.²⁰ None of the contaminants analyzed in well MW-84 were identified above established Maximum Contaminant Levels (MCLs) for drinking water during any of the sampling events.²¹ In 1984, most of the wastes which were the apparent source of the chlorides were removed and the area was covered with clean clay; this may have limited the progress of the chloride plume.²²

¹⁷ City of Benicia, 1996. Public Safety Background Report, Benicia General Plan. February 28.

¹⁸ International Technology (IT) Corporation, 1999. Ground and Surface Water 1998 Annual Report.

¹⁹ MW-84 is located approximately 1400 feet north of Lake Herman Road, and approximately 1400 feet east of the location where Reservoir Road connects with Lake Herman Road.

²⁰ IT Corporation, 1999. Op. cit.

²¹ IT Corporation, 1999. Op. cit.

²² City of Benicia, 1996. Op. cit.

Monitoring of wells located in the Paddy Creek subdrainages indicates that some indicator parameters are elevated relative to background concentrations, but that trends in contaminant concentrations are remaining steady or improving. In addition, contaminant concentrations in Paddy Creek proper are at or near background levels. In summary, results of analytical monitoring of groundwater flow in the drainages that could affect the Project site indicate that by the time groundwater reaches the Project site, contaminant concentrations are below applicable thresholds of concern.

A Supplemental Risk Assessment for Hypothetical Off-site Groundwater Ingestion (Jones & Stokes, 1996) was prepared for contamination to groundwater originating from the IT site; this risk assessment was completed to address potential off-site health risks and hazards associated with ingestion of groundwater in the Paddy Creek drainage on City of Benicia property. That assessment concluded that no cancer risks were associated with potential exposure to chemical concentrations in off-site groundwater from the IT facility. Non-cancer hazards were also less than significant. The assessment further concluded that because of low water supply well productivity, future placement of water wells in this area was unlikely.²³

Based on available information for groundwater and surface water quality at the IT site, risk assessment activities for groundwater ingestion completed for off-site locations potentially affected by the IT site, and the distance from the IT site to the proposed development, it does not appear that releases from this off-site location would have the potential to significantly affect groundwater or surface water quality at the Project site. However, if any adverse change in the groundwater or water quality were to occur at the IT site, DTSC could enforce a corrective action to be implemented to protect the health and well being of the public,²⁴ including potential land uses downgradient from the IT site.

Once closure of the site is achieved, IT will be required to obtain a Post-Closure Permit from DTSC. The permit will be issued for a duration of 10 to 30 years. At the terminus of that period, the site will be re-evaluated by DTSC to assess whether it still poses a threat to public health and environment. If it is found to continue to pose a threat to public health and the environment, permitting will be continued. Quarterly and annual groundwater and surface water monitoring, as described above, would be required throughout the duration of the permit and would be enforced by

²³ Jones & Stokes, 1996. Op. cit.

²⁴ Lecler, 1999. Op. cit.

DTSC.²⁵ (See the Emergency Response and Evacuation Plans section below for air emissions and risk of upset conditions associated with closure of the IT facility).

(b) *Exxon Corporation.* The Exxon Corporation (former Humble Oil and Refining Company) constructed an oil refinery south of the Project site in 1969.²⁶ Releases of petroleum hydrocarbons have occurred at the facility and free-phase petroleum hydrocarbons (including gasoline, diesel, and jet fuel) have been observed on monitoring wells at five locations.²⁷ However, calculated groundwater flow directions at the Exxon facility are to the east (towards Sulphur Springs Creek on the north and east portion of the site) and to the southwest (towards Beaver Creek on the western portion of the site), away from the Project site.²⁸ Based on this information, it is not expected that any past or future releases of hazardous materials to the subsurface or to surface water at the Exxon facility would affect the Project site.

The Exxon facility is located upwind of the Project site for much of the year (particularly in the fall, spring, and summer).²⁹ Accidental releases of hazardous materials to the atmosphere could affect the project site (expected routine emissions are considered in the Air Quality section of this EIR). The EIR for the Exxon Clean Fuels project evaluated the potential hazards associated with fires, explosions, releases of hazardous materials (hydrogen sulfide and sulfur dioxide) to the atmosphere, and found the potential impact to be less than significant. It was determined that the combination of low probability of occurrence and/or minimal expected injury associated with the evaluated impacts rendered them not significant.

(c) *Benicia Water Treatment Plant.* The Benicia Water Treatment Plant was identified on the list of facilities with permitted underground storage tanks.³⁰ Three waste tanks are permitted at this facility, however, no releases have been reported for any of the tanks.³¹ Other hazardous materials are stored at the facility,

²⁵ Lecler, 1999. Op. cit.

²⁶ ENSR, 1993. Draft Negative Declaration and Initial Study Benicia Refinery Proposed MTBE Production Plan Benicia, California.

²⁷ Woodward Clyde Consultants, 1993, Draft Environmental Impact Report, Exxon Benicia Refinery Clean Fuels Project, September.

²⁸ Ibid.

²⁹ Ibid.

³⁰ EDR, 1999a. Op. cit.

³¹ EDR, 1999a. Op. cit.

including gaseous chlorine for water treatment. Up to four one-ton chlorine gas cylinders are stored at the site, with two of these on-line and supplying chlorine gas for water disinfection, and two off-line and securely stored. A secondary containment system was recently installed for the on-line chlorine gas cylinders to capture any chlorine that might be released in the event of a cylinder leak. The chlorine system has three fail safe devices, which include immediate shutoff of chlorine in the event of a power outage, seismic horizontal or vertical movement, or in the event the alarm detects that chlorine has escaped from the cylinder and into the secondary containment system. If chlorine were to leak to this secondary containment, it would be captured by the secondary containment and then later extracted and reused for water disinfection. A 1,000-gallon tank of liquid ammonia is also stored on-site, with containment to capture any releases from the tank. Other minor quantities of hazardous materials are also reportedly stored at the facility for water treatment and equipment maintenance.³²

The Benicia Water Treatment Plant has prepared a Hazardous Materials Business Plan, a Process Safety Management Plan for their operations, and an Accidental Release Prevention Plan (Risk Management Plan) for the chlorine and liquid ammonia that are stored on-site³³ (discussion of these plans is provided in the Hazardous Materials Management and Related Worker Health and Safety Training Requirements below). Preparation and implementation of these plans, in combination with the secondary containment systems, would likely prevent any releases of hazardous materials from the site to air or any surface water that could migrate towards the Project site. Since no releases from the USTs have been reported, no impacts to groundwater from this facility that could potentially affect the Project site are known.

(d) *Benicia Arsenal Site.* The Tourtelot property at the former Benicia Arsenal Site, is located southwest of the Project site. In February 1997, residential construction was discontinued at the Tourtelot property, where live ordnance (UXO) was found. That area was subsequently fenced and security provided to prevent unintentional contact with potential UXO.³⁴ The City recently entered into an agreement with the Corps which allows the City to expedite the cleanup of the Tourtelot property using Corps-approved contractors, with technical assistance and

³² Rovanpera, Scott, Superintendent, Benicia Water Treatment Plant, 1999, personal communication with J. Pettijohn of Baseline, 8 October.

³³ Rovanpera, 1999. Op. cit.

³⁴ Corps, 1998. Op. cit.

oversight provided by the Corps.³⁵ During a subsequent investigation of areas of the Tourtelot property by Earth Technology in early 1999, OE scrap and some OE was recovered.³⁶ Within portions of these off-site adjacent land areas, clearance actions and/or institutional controls were recommended to protect public health based on possible future land uses.³⁷

An Imminent and/or Substantial Endangerment Determination and Remedial Action Order was issued for the Tourtelot property to the responsible parties by DTSC in June 1999.³⁸ DTSC determined that removal and remedial action was necessary at the site because there may be an imminent or substantial endangerment to the public health or welfare or the environment, and the site constitutes a public nuisance. Chemicals of concern identified in the order included UXO, trinitrotoluene (TNT), and lead. The identified responsible parties were required to submit and/or complete several items as required by the Order for the purpose of characterizing the extent of contamination; selecting an appropriate remedy for remediation of the site, including a plan for how these actions would be implemented; completing a health and ecological risk assessment to identify potential human health and ecological risks for site contamination; developing a public participation plan to keep citizens informed of work at the Tourtelot site; and other requirements. As part of any site investigation or remediation activities at the site, health and safety plans must be prepared to ensure the safety of workers involved in these activities, as well as the safety of the neighboring community. California Environmental Quality Act review of the proposed cleanup plan, when developed, would also be conducted, as well as CEQA review of any subsequent development of the property following remediation. Some of the work products outlined above for site investigation have been prepared and have or will soon be submitted to DTSC.³⁹

In addition to the Tourtelot property, other off-site land uses at the Benicia Arsenal included rail spurs and an area used as an ammunition disposal structure. The

³⁵ Kettelhut, 1999. City Wrestles with Issues of Tourtelot, article reviewed via Internet. August 19.

³⁶ Earth Tech, 1999. Op. cit.

³⁷ Earth Tech, 1999. Op. cit.

³⁸ DTSC, 1999. Imminent and/or Substantial Endangerment Determination and Remedial Action Order, Health and Safety Code Sections 25358.3(a), 25355.5(b) (3), 58009, and 58010, In the matter of the Tourtelot Property, Benicia, California.

³⁹ Langmaack, Maria, Earth Technology Corporation, 1999. *Personal communication* with J. Pettijohn of BASELINE. August 10.

approximate location of this off-site land use was just southeast of Lake Herman.⁴⁰ No additional information was identified for these off-site land uses.

Although investigation of the Tourtelot site is ongoing, and remediation activities have not yet been completed, this work would be undertaken under the direction of DTSC, and plans and precautions would be implemented to prevent site contaminants from affecting the health and safety of the surrounding community, including the Project site. Other areas of the Arsenal (described above) are also undergoing investigation and would be restored as needed.⁴¹

c. Relevant Environmental Plans and Policies. The following section summarizes applicable environmental plans and policies, including the Benicia General Plan, the Benicia Zoning Ordinance, and policies of DTSC, and other State and local environmental regulatory agencies.

(1) City of Benicia General Plan. Applicable goals and policies from the City of Benicia General Plan's Community Health and Safety Element are presented below.⁴² The General Plan generally directs the City to make community health and safety a high priority for the City of Benicia and to ensure that existing and future developments are safe from risks to public health that could result from exposure to hazardous materials. Note that list below of goals and policies is not comprehensive. It only includes policy direction that is of significance for the Benicia Business Park project, relative to hazards. For a complete listing, please refer to the General Plan.⁴³

Goal 4.7: Ensure that existing and future neighborhoods are safe from risks to public health that could result from exposure to hazardous materials.

Policy 4.7.4: Promote enforcement of regulatory requirements over the entire term of monitoring of identified hazardous sites within the City limits, especially sites located in residential neighborhoods and near school playing fields and parks.

Goal 4.14: Prevent ground and surface water contamination.

⁴⁰ Corps, 1998. Op cit.

⁴¹ Corps, 1998. Op.cit.

⁴² City of Benicia, 1999. General Plan.

⁴³ City of Benicia, 1999.

Policy 4.14.1 Implement non-point source pollution strategies.

Goal 4.15: Reduce fire hazards.

Policy 4.15.1: Promote the creation and maintenance of natural and artificially constructed firebreaks between development and open space areas through the use of fire-resistive landscaping, weed abatement, discing, and other methods.

Policy 4.15.2: Promote the use of fire-resistant landscaping in public and private developments.

Goal 4.16: Require hazardous materials and hazardous waste management handling and disposal procedures that are protective of human health and the environment.

Policy 4.16.1: Support the Solano County Hazardous Waste Management Plan and its goals, policies, and implementation guidelines for hazardous waste reduction, hazardous waste facility siting, hazardous waste handling and disposal, public education and involvement, and program coordination with regulatory requirements.

Policy 4.16.3: Control water runoff that comes from hazardous substance handling or that enters hazardous substance handling areas.

Goal 4.17: Minimize hazardous waste generation.

Policy 4.17.1: Ensure enforcement of Title 22, California Code of Regulations (CCR) Section 67100 regarding preparation and implementation of source reduction plans by hazardous waste generators.

Goal 4.20: Reduce health and safety hazards associated with hazardous material users, hazardous waste generators, and hazardous waste disposal sites and toxic air contaminants.

Policy 4.20.1: Establish buffer zones between sensitive land uses and those land uses which involve the significant use, storage, or disposal of hazardous materials, hazardous waste, or toxic air contaminants.

Goal 4.21: Reduce significant hazards associated with pipelines and high voltage transmission lines.

Goal 4.22: Update and maintain the City's Emergency Response Plan.

Policy 4.22.2: Develop at least two exit routes, where feasible, for new developments. One of the exits could be a pedestrian route.

Policy 4.22.3: Provide the public with information on specified emergency evacuation routes.

(2) Benicia Zoning Ordinance. In general, the purpose of the Benicia Zoning Ordinance related to hazardous materials⁴⁴ is not to require additional regulation, but to ensure that the existing regulations are complied with and the City is notified, as required by law, of hazardous materials uses in Benicia.

A use permit for hazardous materials may be required for any new use of hazardous material that would require permitting under the Uniform Fire Code.⁴⁵ A Hazardous Materials Release Response Plan, must be submitted to the City of Benicia Fire Department as a condition of the zoning permit, if it required to be prepared for the Project via State regulations (See Hazardous Materials Management and Related Worker Health and Safety Training Requirement section below for Hazardous Material Business Plan requirements). Aboveground tanks for flammable liquids shall be allowed only at refinery or bulk storage plant locations with the approval of the Benicia Fire Department Chief.

(3) Site Investigation and Remedial Regulation Requirements. The process for hazardous waste landfill site investigation, closure and post closure activities are generally described above for the IT Panoche facility as required by DTSC and the RWQCB under CCR Titles 22 and 23 and Title 40 Code of Federal Regulations (CFR). The need to close the facility is based on the need to minimize further maintenance and to control, minimize, or eliminate post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated surface water, or waste decomposition products to the ground, surface waters, or atmosphere. The closure and post closure plans, described above, for the IT Panoche facility are designed to satisfy the closure performance standard.⁴⁶

⁴⁴ Benicia Zoning Ordinance, Title 17, Chapter 17.70.26.

⁴⁵ Underground storage tanks, and sites with any quantity of containers of 10-gallons or less for retail or wholesale purposes are exempted.

⁴⁶ Jones & Stokes, 1996. Op. cit.

The general process for site investigation and remedial actions at sites contaminated with hazardous materials are described above for the former Benicia Arsenal site, as required by DTSC.

(4) Hazardous Materials Management and Related Worker Health and Safety Training Requirements. Several local, State, and Federal requirements pertain to hazardous materials transport, use, storage, disposal, and training of workers handling these materials. Generally, State requirements mirror Federal requirements, and in some cases are more stringent than Federal requirements. State requirements, which can be strengthened through the adoption of local ordinances, are often enforced by the local administering agency, such as the fire department or county health department.

There are specific requirements for storage of hazardous materials in excess of threshold limits. For example, the State Office of Emergency Services would require a Hazardous Materials Business Plan (Business Plan)⁴⁷ for storage of quantities of hazardous materials equal to greater than 55 gallons of liquid hazardous materials (including hazardous wastes), 500 pounds of solids, or 200 cubic feet of compressed gases. Although future tenants in the Project site have not yet been identified, based on proposed commercial/light industrial land uses, some examples of hazardous materials that could be stored during operation of the proposed Project in quantities subject to the Business Plan requirements include petroleum hydrocarbons (e.g., gasoline, diesel, motor oil, grease, lubricants), paints, and compressed gases, acids, and pesticides/herbicides for landscape management. In Benicia, the requirements for a Business Plan are administered by the Solano County Department of Environmental Management (County). The Business Plan should contain facility maps, up-to-date inventories of all hazardous materials equal to or above the threshold limits above, emergency response procedures, equipment, and an employee training program.

Generators of hazardous waste (e.g., waste oil, waste antifreeze) are subject to Business Plan and Contingency Plan requirements, if these wastes are generated in quantities equal to or greater than the threshold requirements above. Contingency Plan⁴⁸ requirements include identification of duties of the emergency coordinator, identification and location of emergency response equipment, and reporting procedures in the event of a spill or other emergency. Hazardous wastes must be properly packaged, stored, manifested, and disposed of at a permitted off-site facility in accordance with local, State, and federal requirements; generators of hazardous

⁴⁷ California Health and Safety Code, Chapter 6.95, Section 25500 et seq; 19 CCR 2620 et seq.

⁴⁸ Title 22, CCR 66265.50-66265.56.

wastes much be registered by the U.S. Environmental Protection Agency.⁴⁹ Requirements for hazardous waste management are regulated by DTSC and the U.S. EPA.

In addition to the Business Plan and Contingency Plan requirements, preparation of an Accidental Release Prevention Plans (ARPP) for acutely hazardous materials may be required if there is a significant likelihood that this use may pose an accident risk for acutely hazardous materials stored above threshold quantities and to improve the response to accidents that do occur.⁵⁰ Facilities with aboveground or underground tanks must also be permitted.⁵¹ Other plans, such as Spill Prevention Control and Countermeasures Plans⁵² may also be required for aboveground tanks, depending on the tank size, location and contents. Some facilities may also be required to prepare Process Safety Management Plans for their operations. The purpose of these plans is to eliminate, to a substantial degree, the risks to which employees are exposed in petroleum refineries, chemical plants, and other facilities.⁵³

Requirements for worker training and establishment of employer programs for worker health and safety training related to hazardous materials use would also likely be required for tenants within the Project site. Some of these include: Hazard Communication Programs and worker training,⁵⁴ Injury and Illness Prevention Plans and training,⁵⁵ Emergency Action Plan and training,⁵⁶ Fire Prevention Plan and training,⁵⁷ Permissible Exposure Limit for hazardous materials,⁵⁸ and other applicable regulatory requirements based on the work to be performed and the hazardous materials used.

⁴⁹ Title 22, CCR; 40 CFR.

⁵⁰ California Health and Safety Code 25531 et seq; 40 CFR 68.

⁵¹ California Health and Safety Code Section 25270 et seq.; California Health and Safety Code Section 25280 et seq.; Uniform Fire Code; 3 United States Code (USC) 1251; 42 USC 6991; Title 23 CCR 2610-2873; 40 CFR 112 et seq.; 40 CFR 112.3 and 112.7; 40 CFR 280.

⁵² 40 CFR 112.3 and 112.7.

⁵³ Title 8, CCR Section 5189.

⁵⁴ Title 8, CCR Section 5194.

⁵⁵ Title 8, CCR Sections 1509 and 3203.

⁵⁶ Title 8, CCR Section 3220.

⁵⁷ Title 8, CCR Section 3221.

⁵⁸ Title 8, CCR Section 5155.

(5) Lead and Asbestos Building Materials Abatement Regulations.

Lead is a suspect carcinogen, a known teratogen (i.e., causes birth defects), and a reproductive toxin. Federal and State regulations govern the demolition of structures where lead or material containing lead are present. Regulations pertaining to demolition of structures with lead-based paint are promulgated by the U.S. EPA, DTSC, and Housing and Urban Development (HUD). For example, the U.S. EPA and DTSC require that lead-based paint equal to or greater than the HUD definition of lead-based paints (greater or equal to 1 mg/cm² or 0.5 percent lead by weight) be removed prior to demolition if the paint is loose and/or peeling. If the paint is securely adhering to the substrate, the entire material may be disposed of as a demolition debris, which is a non-hazardous waste. Loose and peeling paint must be disposed of as a California and/or Federal hazardous waste if the concentration of lead exceeds applicable waste thresholds. Hazardous wastes must be appropriately managed, labeled, transported and disposed of in accordance with local, State, and Federal requirements by trained workers.

The majority of regulations for the protection of workers involved in lead abatement activities are promulgated by the federal and State Departments of Industrial Relations, Division of Occupational Safety and Health (OSHA), and California Department of Health Services.⁵⁹ Air monitoring, appropriate respiratory protection and other personal protective equipment for workers, methods of compliance (e.g., engineering and work practices), and other requirements would apply, depending on the extent of a worker's potential exposure to lead.

Asbestos is a known human carcinogen. Federal, State, and local requirements also govern the removal of asbestos or suspected asbestos-containing materials, including the demolition of structures where asbestos is present. These requirements are promulgated by the U.S. EPA, Federal and State OSHA, DTSC, and the Bay Area Air Quality Management District (BAAQMD). All friable asbestos-containing materials (ACM), or non-friable ACM subject to damage, must be abated prior to demolition in accordance with BAAQMD requirements. Friable ACM must be disposed of as an asbestos waste at an approved facility. Non-friable ACM may be disposed of as non-hazardous waste at landfills that will accept such wastes. As above, ACM wastes must be packaged, labeled, manifested, transported, and disposed of in accordance with local, State, and Federal regulations.

Workers conducting asbestos abatement must be trained in accordance with the Cal/OSHA and Federal OSHA Construction Standards and have appropriate

⁵⁹ 29 CFR, Part 1926.62; Title 8, CCR 532.1; CDHS Training, Certification and Workpractices Rule.

Asbestos Hazardous Emergency Response Act (AHERA) training, as applicable, based on the abatement job. Appropriate containment, work practices, engineering controls, air monitoring, respiratory protection and other personal protective equipment for workers, hazard communication, and other requirements may apply under these regulations.⁶⁰

(6) Wildland Fires. The Project site has been designated as within a Brush/Grasslands/Wildlands area and thus a potential fire hazard within the City of Benicia Planning Area.⁶¹ The City of Benicia Fire Department administers a vegetation control program to control open space fire hazards in accordance with the requirements of the General Plan. The program includes annual inspections of open space areas. Property owners, both commercial and residential, who do not meet setback requirements (30 feet) from wildland vegetation are notified to remove that vegetation. In addition, 30- to 40-foot fire breaks are disced annually on open space slopes.⁶² Some evidence of discing was observed in the Project site, just south of Lake Herman Road, at the time of the June 1999 site reconnaissance; the discing was likely for vegetation/fire control.

(7) Emergency Response and Evacuation Plans.

(a) *City of Benicia.* The Benicia Fire Department is responsible for emergency response and emergency evacuation planning for the City of Benicia, in accordance with the General Plan. An Emergency Response Plan for the City is currently being revised by the Benicia Fire Department. Individual requirements for emergency response plans from Benicia business are determined by the Fire Department on a project-by-project basis and are incorporated as conditions of Project approval.⁶³

The City of Benicia overall Emergency Response Plan includes construction of a Community Alerting System (CAS), which is scheduled to be completed end of September 1999.⁶⁴ There are currently five nodes (sirens) spread out through out the

⁶⁰ 29 CFR 1926.1101; 40 CFR 61 and 152; Title 8 CCR Section 1529; BAAQMD Regulation 11, Rule 2.

⁶¹ City of Benicia, 1999. Op.cit.

⁶² Carlson, Phil, Assistant Fire Marshall, Benicia Fire Department, 1999. *Personal communication* with T. Taylor of BASELINE. June 15.

⁶³ Carlson, 1999. Op. cit.

⁶⁴ Fiori, Pete, Emergency Response Coordinator, City of Benicia, 1999. *Personal communication* with W. Scott of BASELINE. August.

community of Benicia for notifying citizens via the CAS. The area of the proposed Benicia Business Park is within the area that is covered by these five sirens.⁶⁵

Upon activation of CAS, citizens would tune into the appropriate television or radio station to obtain further instructions about how to protect themselves in the event of the emergency (e.g., shelter in place, evacuate) and for updates on the emergency condition. Once the system is completed, the public would be educated on the CAS through community mailers, local newspapers, and their water bill. New businesses would also receive information with their business licence on what to do during the activation of CAS.⁶⁶

(b) *Permitted and Unpermitted Airborne Releases.* During operations of the proposed Project, regular (permitted) releases as well as accidental (unpermitted) releases or other emergencies could take place at neighboring properties including the IT Panoche site and Exxon facility which could potentially affect occupants of the Project site and require implementation of the City's CAS. Permitted releases and response procedures for unpermitted releases and other emergencies are described below.

IT Panoche

Facility Operations, Accidental Releases, and Other Emergencies. Facility operations at the IT site will no longer generate airborne emissions, as wastes were accepted only until 1986. Potential accidental airborne releases or other emergencies, however, could take place at the IT Panoche facility during the closure or post closure process which could potentially impact occupants of the Project site.

Conservative estimates of exposure by inhalation of particulates and volatile organic compounds by off-site receptors (humans) were assumed to take place during various activities during closure (e.g., movement of wastes to consolidation areas, drying and compacting the wastes, remediating drum burial areas, and operating groundwater evaporation systems). Risks and hazards were calculated separately for chemicals (Jones & Stokes, 1996) that do not cause cancer (but may cause other effects) and those that do cause cancer, as is a common risk assessment practice. Potential risk estimates were generated for 1) a worst-case exposure scenario and 2) risks for a limited-probability scenario (one full year of exposure during closure, 24

⁶⁵ Fiori, 1999. Op. cit.

⁶⁶ Fiori, 1999. Op. cit.

hours per day), which was considered by the preparers of the risk assessment as a more realistic exposure duration (Jones & Stokes, 1996).

Calculated average annual non carcinogenic hazards and cancer risks for inhalation for the worst-case off-site human scenario exceeded regulatory thresholds of significance, while inhalation hazards under the limited-probability scenario for both adults and children was substantially less than the significant hazard and cancer risk threshold. Potential off-site exposure to particulates and volatiles that could be generated during closure activities at the IT site was therefore considered to be less than significant based on the more realistic limited-probability scenario.⁶⁷ Health risks and hazards under post-closure activities were expected to be substantially less than those associated with closure and were considered less than significant in the Draft Environmental Impact Report prepared for the closure and post closure of the IT facility. These risk estimates were calculated in absence of air pollutant emission controls which would also be used during closure activities with required permits from BAAQMD to reduce potential emissions. Risks from other accident conditions, during closure of the IT site, (e.g., spills during transport of hazardous materials to and from the facility), were also expected to be less than significant.⁶⁸

Based on this analysis, potential airborne emissions during closure and post closure of the IT landfill would not be expected to pose an unacceptable health risk to future users of the Project site, or an unacceptable health risk or hazard from other possible on-site emergencies (e.g., transportation accidents). However, the City's CAS could be used to notify potential future users of Benicia Business Park if airborne emissions or other emergencies at the IT site could pose a health hazard.

Exxon

Facility Operations. A health risk assessment that has been accepted by BAAQMD reportedly indicates health risk impacts below BAAQMD's established levels of public health risk significance⁶⁹ for permitted releases for the Exxon facility. Both Exxon and the California Air Resources Board monitor air quality at and near the refinery to identify and monitor airborne

⁶⁷ Jones & Stokes, 1996. Op. cit.; note that the health risk assessment received independent technical review.

⁶⁸ Jones & Stokes, 1996. Op. cit.

⁶⁹ City of Benicia, 1992. Sky Valley Benicia Specific Plan, Draft Environmental Impact Report.

releases of hazardous materials to ensure compliance with permitted emissions.⁷⁰ Violation notices are issued upon excessive releases.⁷¹

Accidental Releases and Other Emergencies. As described above, facilities that store extremely hazardous materials over threshold limits, such as the Exxon facility, are required to prepare a Risk Management Plan (now called Accidental Release Prevention Plan). An RMPP was required by Solano County, the local administering agency, and was submitted for the Exxon facility in 1990. In the RMPP, two acutely hazardous materials identified to be of greatest concern in the event of an accident at the Exxon facility were anhydrous (gaseous) ammonia and hydrogen sulfide. For each of these materials, four credible, worst-case accident scenarios were evaluated. Concentrations were estimated at the maximally exposed off-site individual, a hypothetical individual assumed to be located at the point where the highest concentrations in air were expected to be found (regardless of actual land use or locations of populations surrounding the refinery).

Based on this analysis, the most severe, yet credible, toxic material impacts related to the refinery would be moderate adverse health effects from exposure to hydrogen sulfide or ammonia (e.g., irritation). No permanent health impairments or fatalities would be expected from the accidental release of toxic materials at the refinery.⁷² Other accident conditions were evaluated during upgrading of the Exxon facility to construct an operate a methyl tertiary butyl ether (MTBE) process unit, including upsets during process operation, material handling, storage and chemical transportation. These upset conditions were also determined to have no impact or insignificant impacts based on the defined significance criteria used in this evaluation.⁷³

Emergency Procedures. In the event of any emergency (e.g., fire, explosion, spill, leak, airborne release) at the refinery, including an airborne release which could potentially impact future users of Benicia Business Park, a trained Exxon on-site emergency response team (ERT) which is staffed 24 hours a day would respond to the emergency. If a pre-established threshold for airborne emissions were exceeded as recorded by the perimeter air

⁷⁰ ENSR, 1993. Op. cit.

⁷¹ City of Benicia, 1999. Op. cit.

⁷² ENSR, 1993. Op. cit.

⁷³ ENSR, 1993. Op. cit.

monitoring system, the system would sound an alarm to notify the ERT to respond and to mitigate the problem. The ERT would be the first on-site responders at the facility and would notify and request assistance from the City of Benicia Fire Department's Emergency Response Coordinator or City of Benicia Police Department, as needed, in addressing the emergency. During any significant emergency event, the Fire Department Emergency Response Coordinator or the Police Department, in cooperation with Exxon's ERT, would sound the Community Alerting System to notify the community of the danger,⁷⁴ as described above.

Permitted releases from the Exxon facility therefore would not pose an unacceptable health risk to future users of the Benicia Business Park Project site. In the event of an airborne accidental release at the facility, health effects to future users of the proposed Benicia Business Park are possible, but would be minimized by response of the on-site Exxon hazardous materials team, and operation of the CAS, as needed, by the Benicia Fire Department or Police Department.

2. Impacts and Mitigation Measures

a. Thresholds of Significance. The proposed Project would have a significant impact on public health and safety from hazards and hazardous materials if it would:

- Create hazards associated with inconsistency with adopted policies;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, and as a result, would create a significant hazard to the public or the environment;
- Create a hazard or potential hazard, or expose people to existing health hazards;
- Create a significant hazard to the public or environment through the transport, use, or disposal of hazardous materials;
- Involve a risk of release of hazardous substances, including but not limited to: pesticides, petroleum hydrocarbons, or other hazardous materials;
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urban areas or where residences are intermixed with wildlands; or
- Impact or physically interfere with an adopted emergency response plan or emergency evacuation plan.

⁷⁴ Newhouse, Fred, 1999. Human Resources Community Resources Manager, Exxon, *personal communication* with W. Scott of BASELINE. August.

b. Less-than-Significant Hazards Impacts. The proposed Project would be generally consistent with the Benicia General Plan goals and policies. Public health protection is afforded by the applicant's intended compliance with regulations pertaining to hazardous materials and hazardous waste management, emergency response, and fire protection.

c. Significant Impacts and Mitigation Measures.

Impact HAZ-1: Transport, storage, or handling of fuels, lubricants, and other chemicals at the Project site for heavy machinery operation/maintenance during site development activities could result in hazardous materials releases. (S)

Grading activities would be conducted within the Project site during the early stages of construction using diesel-powered equipment. It is possible that fueling and maintenance of this equipment would be conducted on-site for a limited amount of time. Fueling and vehicle maintenance would involve the use of fuels, degreasing agents and other hazardous materials. Other hazardous materials (e.g., paints, curing agents) would also be brought into the Project site during construction activities as part of site development. Transport, storage, or handling of these materials may result in releases to the environment and adverse human health effects.

Mitigation Measure HAZ-1: The contractor(s) overseeing the grading and Project site development shall prepare and implement a spill prevention plan for potentially hazardous materials to be used during development activities. The plan shall be prepared prior to the start of earth working activities. The plan shall designate an on-site employee(s) responsible for plan implementation and include types and quantities of hazardous materials, anticipated equipment needs and maintenance, temporary hazardous materials storage areas, emergency response procedures for hazardous materials releases, and procedures for contacting regulatory agencies in the event of a hazardous materials release. The spill prevention plan may be prepared as part of a Storm Water Pollution Prevention Plan (see Section C, Hydrology and Water Quality). (LTS)

Impact HAZ-2: Proposed site development activities would increase the volume and types of hazardous materials transported, stored, and used within the Project site, causing a potential hazard to public health and safety. (S)

The types of hazardous materials to be used within the Project site is unknown, but would likely include the use of petroleum hydrocarbons, compressed gases, paints, acids, and pesticides/herbicides for landscape maintenance activities based on the proposed land uses. These hazardous materials would be transported, stored, and

used on-site. An accidental release could occur associated with these activities, potentially causing adverse health effects to exposed persons. The type of health effects would depend on the material released and duration of exposure.

Numerous local, State, and Federal regulations and ordinances pertain to the proper transport, use, storage and disposal of hazardous materials (and hazardous wastes), including training for workers handling these materials. Regulations also pertain to the use and application of pesticides and herbicides, including storage, worker training, and pesticide applicator requirements.

Mitigation Measure HAZ-2: Compliance with applicable local, State, and Federal regulations for hazardous materials (including pesticides and herbicides) and hazardous waste transport, use, storage and worker training would protect against significant hazardous materials impacts from Project operations. (LTS)

Impact HAZ-3: Site workers involved in demolition activities within the Project site could be potentially exposed to lead-based paint and asbestos-containing building materials, potentially causing adverse health effects. Site workers involved in development activities could also be potentially exposed to other hazardous materials that may be present on-site. (S)

Proposed development of the Project site would require demolition of farm structures, observed from Lake Herman Road and Industrial Way during the site reconnaissance. No other structures are located within the Project site. The date of construction of the structures are unknown, however, based on observations made during the site reconnaissance, they are believed to have been constructed prior to 1978, before the Federal government banned the use of lead-based paint in housing. These structures may therefore have been painted with lead-based paint and/or may contain asbestos-containing materials, which could be a health hazard for workers involved in demolition activities.

Workers involved in site development activities could be exposed to potentially hazardous materials that may be present in the drum that was observed near Lake Herman Road during the site reconnaissance. The drum was observed to be damaged and not stored in an upright position. The contents of the drum are unknown.

The health effects from exposure to lead are described above. Asbestos is a known occupational carcinogen. Exposure to lead and asbestos by demolition workers would primarily be via the inhalation exposure route by disturbing building materials containing asbestos and/or lead during demolition activities. Exposure to hazardous materials, if present in the damaged unlabeled drum, could pose a health hazard to

workers involved if the drum were further damaged or moved. The primary routes of exposure would be by inhalation and/or dermal contact. The type of health effects would be based on the hazardous properties of the material, if present, and the duration of exposure.

Federal and State regulations govern the demolition or renovation of structures where lead or materials containing lead are present. All loose or peeling lead-based paint would require removal prior to demolition. Federal, State, and local regulations also require the removal and proper disposal of asbestos or suspect asbestos-containing materials prior to demolition. All lead-based paint and asbestos removal activities must be conducted by trained workers under direction of an appropriate health and safety plan to minimize potential exposure. Following removal and demolition of these structures, there would be no potential exposure by workers or the surrounding public to hazardous building materials. Federal and State regulations also govern the management, transport, and disposal of hazardous materials (including hazardous wastes). Following site development there would be no potential exposure to drummed hazardous materials.

Mitigation Measure HAZ-3a: The following measures would be implemented, as required by Federal, State, and local regulations, to ensure that potential exposure to hazardous building materials is reduced to a less than significant level.

1. The applicant shall ensure that a lead-based paint and asbestos survey is prepared by a qualified environmental professional (e.g., CDHS-certified Lead Inspector/Assessor, Certified Asbestos Consultant) for all buildings to be demolished. Representative colors, textures, and substrates of the buildings shall be included in the sampling.
2. The applicant shall ensure that specifications for the safe removal and disposal of asbestos and lead-based paint and other hazardous building material, if present, are prepared by a qualified environmental professional (e.g., AHERA-Accredited Project Designer and Certified Asbestos Consultant and CDHS-certified Project Designer for lead) based on the results of the surveys, and conducted by a certified contractor(s) prior to building demolition. The specification shall include the proper testing, packaging, manifesting, and transport of demolition wastes by trained workers to a permitted facility for disposal, in accordance with local, State, and Federal requirements.

3. The applicant shall ensure that a health and safety plan is prepared and implemented by a qualified environmental professional (e.g., Certified Industrial Hygienist, Certified Asbestos Consultant for asbestos, CDHS-certified Project Monitor/Supervisor for lead), for all workers involved in building removal or demolition activities. The purpose of the health and safety plan shall be to mitigate potential exposure of workers to asbestos, lead-based paint, or other hazardous building materials, if present. The plan shall specify training and certification requirements, air monitoring requirements, personal protective equipment for workers, engineering controls and work practices, housekeeping procedures, hygiene facilities, medical surveillance requirements, Project monitoring/supervision, required permits, and other items for protection of workers involved in demolition activities, and public health protection as required by local, State, and Federal requirements.

Mitigation Measure HAZ-3b: The unlabeled drum identified during the site reconnaissance shall be removed prior to site development activities. Prior to removal, the drum shall be examined, and if the drum is found to contain material, sample(s) of the drum shall be collected by trained workers for purpose of profiling the material prior to drum transport. Analysis of samples from the drum shall be conducted by a California-certified laboratory, under chain-of-custody procedures. Once the contents of the drum have been profiled, the drum with its contents shall be removed from the site and transported to an appropriate facility for recycling or disposal, as appropriate, in accordance with local, State, and Federal requirements for hazardous waste management, by trained workers. (LTS)

Impact HAZ-4: Proposed development within the Project site would attract additional people to light industrial/commercial areas located near grassland areas, potentially contributing to an increased fire hazard. (S)

Site development activities would take place in areas that are open grassland. This area has been designated as a potential fire hazard by the City of Benicia.⁷⁵ During site development activities, a fire emergency at this location could expose people and/or structures both on and off-site to a significant risk of loss, injury or death.

Following site development activities, irrigated landscaping and paved surfaces would act to reduce potential fire hazards, although wildland grasses could remain beyond the perimeter of irrigated areas, and wildland grasses would be located north

⁷⁵ City of Benicia, 1999. Op. cit.

and west of the Project site. Owners/operations of structures built on the Project site would be required to comply with applicable requirements for maintaining fire breaks, as applicable, and other applicable fire protection regulations (e.g., Uniform Fire Code, California Building Code) and the City would also continue to manage fuels in open space areas, as previously described.

Mitigation Measure HAZ-4a. The applicant shall prepare and implement a fire prevention and preparedness plan during site development activities. The plan shall be prepared prior to the start of earth working activities at the site. The plan shall designate an on-site employee(s) responsible for plan implementation and include potential fire hazards, emergency response procedures for fires including evacuation routes and places of safe refuge, and procedures for contacting emergency responders in the event of a fire. Workers involved in site development activities shall receive training in these procedures at the start of site development activities. The fire prevention and preparedness plan may be prepared as part of other required plans.

Mitigation Measure HAZ-4b. Compliance with requirements for maintaining fire breaks, and other fire protection regulations (e.g., Uniform Fire Code, California Building Code) and the City's ongoing maintenance of fuel management in open space areas during Project operations, would reduce the potential impacts related to wildland fires to a level of less than significant. (LTS)

Impact HAZ-5: The proposed Project could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. (S)

The proposed development within the Project site would include development of a 527.5- acre site for industrial and commercial uses, in an area that is currently vacant grassland. Development of the Project site would include the construction of streets to provide access to the industrial and commercial areas and other utilities (e.g., water).

Existing Emergency Response Plans developed for the City of Benicia by the Fire Department may not include procedures for emergency response or evacuation of persons from the Project site, since this area is currently not developed. Lack of appropriate plans could contribute to an increased response time for emergency responders who are unfamiliar with access and egress locations for the new development area or the location of emergency equipment (e.g., fire hydrants). Outdated plans could also delay evacuation of persons from the Project site in the event of an emergency.

Mitigation Measure HAZ-5: The applicant shall contact the Benicia Fire Department and Benicia Police Department to ensure that development within the Project site is considered when the City's Emergency Response Plan is updated and for the purpose of ensuring that businesses within the Project site are notified of the Community Alerting System and appropriate access and egress locations are identified. (LTS)

Impact HAZ-6: Workers involved in site grading, earthwork, or demolition activities could encounter hazardous materials within the Project site, for example, unexploded ordnance, explosives, or other hazardous materials, potentially causing physical injuries, death, or other adverse health effects. (S)

The western portion of the Project site was located within an area leased by the former Benicia Arsenal in a former revetment area. Explosives were temporarily stored and destroyed at the revetment area.

Sampling within the Project site has been conducted for unexploded ordnance (UXO), ordnance and explosives (OE), and ordnance and explosives scrap material (OE scrap). UXO and OE are potentially hazardous to humans if disrupted, and may cause physical injuries or death. OE scrap includes those items that are fragments of functioned ordnance, and that contain no explosive or other items of a dangerous nature. Investigation of the areas within the proposed Project area for 0.50 caliber rounds that may have been stored in railcars that may have burned in a 1946/1947 fire within the former Benicia Arsenal revetment area was also conducted. The rationale for investigation of areas within the former Benicia Arsenal was based on different prior, current, or potential future land use than the surrounding property, in addition to specific past Department of Defense activities such as demolition operations or test firing of artillery rounds.⁷⁶

During subsurface sampling of areas within the Project site, no OE scrap, UXO, or OE were recovered during this investigation. In addition, no 0.50-caliber rounds were recovered. Based on the results of this field investigation, no Department of Defense Actions were recommended for areas within the Project site under current or anticipated future land use (future land use was assumed to be limited industrial which would be expected to be protective of commercial land uses). However, not all areas of the Project site that were within the former revetment area were sampled during the investigation since statistical approaches were used to identify sampling locations. Although it is unlikely based on the results of the sampling completed to date, it is possible that UXO or OE could be encountered during site earthwork

⁷⁶ Earth Tech, 1999. Op. cit.

activities within the Project site based on past land uses, potentially causing injury or death to on-site workers involved in these activities.

If potential UXO or OE are encountered on any public or private lands, the local law enforcement agency must initially respond. The Department of the Army Explosive Ordnance Disposal Units, located throughout the United States, are responsible for responding to incidents involving military ordnance on public/private property. The Army responds at the request of the local law enforcement authority. If numerous items are found in a particular area, the local district of the Army Corps of Engineers should also be contacted to determine if further action is warranted.⁷⁷ Even though discovery of ordnance appears to be a low probability event, the extreme ramifications associated with disturbance of ordnance, if found, warrant construction-period mitigation.

In addition to the investigation described above, the Sacramento District of the U.S. Army Corps of Engineers (Corps) is investigating and identifying potential hazardous waste sites at the former Benicia Arsenal, including areas within the proposed Project. The initial investigation will include archival searches, on-site investigations, interviews, and collection of soil and groundwater samples.⁷⁸ No hazardous materials uses of the Project site were identified by the Corps as part of this work. However, some rail spurs were located within the Project area and could have carried other materials besides UXO and OE. Any releases associated with transport or temporary storage of these materials could have contributed to subsurface contamination. Health effects could be experienced by workers involved in earth-moving activities if exposed to hazardous materials, if present. The type and severity of health effects would be based on the type of material encountered and duration of exposure.

Mitigation Measure HAZ-6a: If any known or suspected unexploded ordnance or explosives is encountered during earthwork activities on-site, construction in that area shall be immediately halted and all personnel shall vacate the area. The contractor(s) shall then contact the 911 emergency system to report the emergency and request assistance. Unexploded ordnance/explosives discovery procedures shall be documented by the contractor(s) prior to the start of earthwork activities, posted in the work area, and discussed with all on-site personnel prior to work on the site. (These procedures may be developed as part of other required plans, see mitigation measures above).

⁷⁷ Earth Tech, 1999. Op. cit.

⁷⁸ Corps, 1998. Op. cit.

The local responding agency (e.g., Benicia Police Department or Fire Department) shall contact the Department of the Army Explosive Ordnance Disposal Units and Sacramento District of the Army Corps of Engineers, as needed, to assist in removal of any identified unexploded ordnance or explosives, and to determine if further action is needed prior to the time that site development work resumes in the area. Work shall not resume in the affected area until the area it is deemed safe to do so by the local responding agency, and/or the Department of Army Explosive Ordnance Disposal Unit or the Sacramento District of the Army Corps of Engineers.

Mitigation Measure HAZ-6b: If contaminated soil is encountered or suspected during site development activities (through soil discoloration or odor), all work shall halt in the immediate area and personnel shall immediately vacate the area. Soil samples shall then be collected by a qualified environmental professional (e.g., registered geologist, professional engineer) prior to further work in the area(s). The samples shall be submitted for laboratory analysis by a State-certified laboratory under chain-of-custody procedures. The analytical method(s) shall be selected by the environmental professional based on the suspected contamination and consideration of historical land uses of the site and any previous analyses completed for soil samples collected in the area(s), if applicable. The analytical results shall be reviewed by a qualified environmental professional (e.g., Certified Industrial Hygienist). The professional shall provide recommendations, as applicable, regarding soil management, worker health and safety training, and regulatory agency notifications, in accordance with local, State, and Federal requirements. Work shall not resume in this area(s) until these recommendations have been implemented. (LTS)

The project site is located within the Benicia Business Park, which is a designated industrial area. The site is currently occupied by various industrial facilities, including a large warehouse and several smaller buildings. The surrounding area is primarily industrial, with some residential areas located to the north and east. The project involves the construction of a new industrial facility, which will be situated within the existing industrial zone. The project is expected to have minimal impacts on the surrounding environment, as it is located within a designated industrial area. The project will be subject to various regulatory requirements, including those related to hazardous materials and environmental impacts. The project owner has committed to implementing various mitigation measures to minimize potential impacts on the surrounding environment. These measures include the installation of containment systems for hazardous materials, the implementation of strict safety protocols, and the establishment of emergency response procedures. The project is expected to create new jobs and contribute to the local economy. The project is also expected to have a positive impact on the surrounding community, as it will provide a source of employment and increase the tax base. The project is expected to be completed within a reasonable timeframe, and the new facility is expected to be operational by the end of the year. The project is expected to have a positive impact on the surrounding environment, as it will provide a source of employment and increase the tax base. The project is expected to be completed within a reasonable timeframe, and the new facility is expected to be operational by the end of the year.

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E. BIOLOGICAL RESOURCES

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The section describes: 1) the methods used to assess biological resources at the Project site; 2) regulatory requirements and agency jurisdiction; 3) vegetation and wildlife resources on the site; 4) the presence or potential presence of special-status species; and 5) potential impacts to biological resources on the site and measures to mitigate these impacts.

1. Setting

a. Methodology. Prior to conducting a survey of biological resources on the Project site, the California Natural Diversity Data Base (CNDDB 1999) and the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (5th ed.) (Skinner and Pavlik, 1994) were consulted to identify sensitive habitats and special-status plant and wildlife species, which are known to occur in the vicinity of the site. Reports of biological resources on and adjacent to the Project site were also reviewed, including the *Verified Wetlands Delineation and Jurisdictional Determination for the Seeno Benicia Business Park Project, City of Benicia, Solano County, California (ACOE File No. 18366E)* (Sycamore, 1997a), the *Rare Plant Surveys and Habitat Assessment for Wetlands at the Seeno Benicia Industrial Park Project, City of Benicia, Solano County, California* (Sycamore, 1997b), and the *Rare Plant Surveys of Upland Habitats, Seeno Benicia Industrial Park Project, City of Benicia, Solano County, California* (Sycamore, 1999) (see Appendix C).

As part of the peer review process, LSA Associates, Inc. conducted a reconnaissance level survey of biological resources on the Project site on August 5, 1999. The survey involved walking transects in a random pattern over the entire site to: 1) identify plant and wildlife species present; 2) identify sensitive habitats; and 3) identify special-status species and/or habitats that could support special-status species. All sensitive habitats and special-status species observed were recorded in field notes and mapped on a 1"=200' scale topographic map of the site.

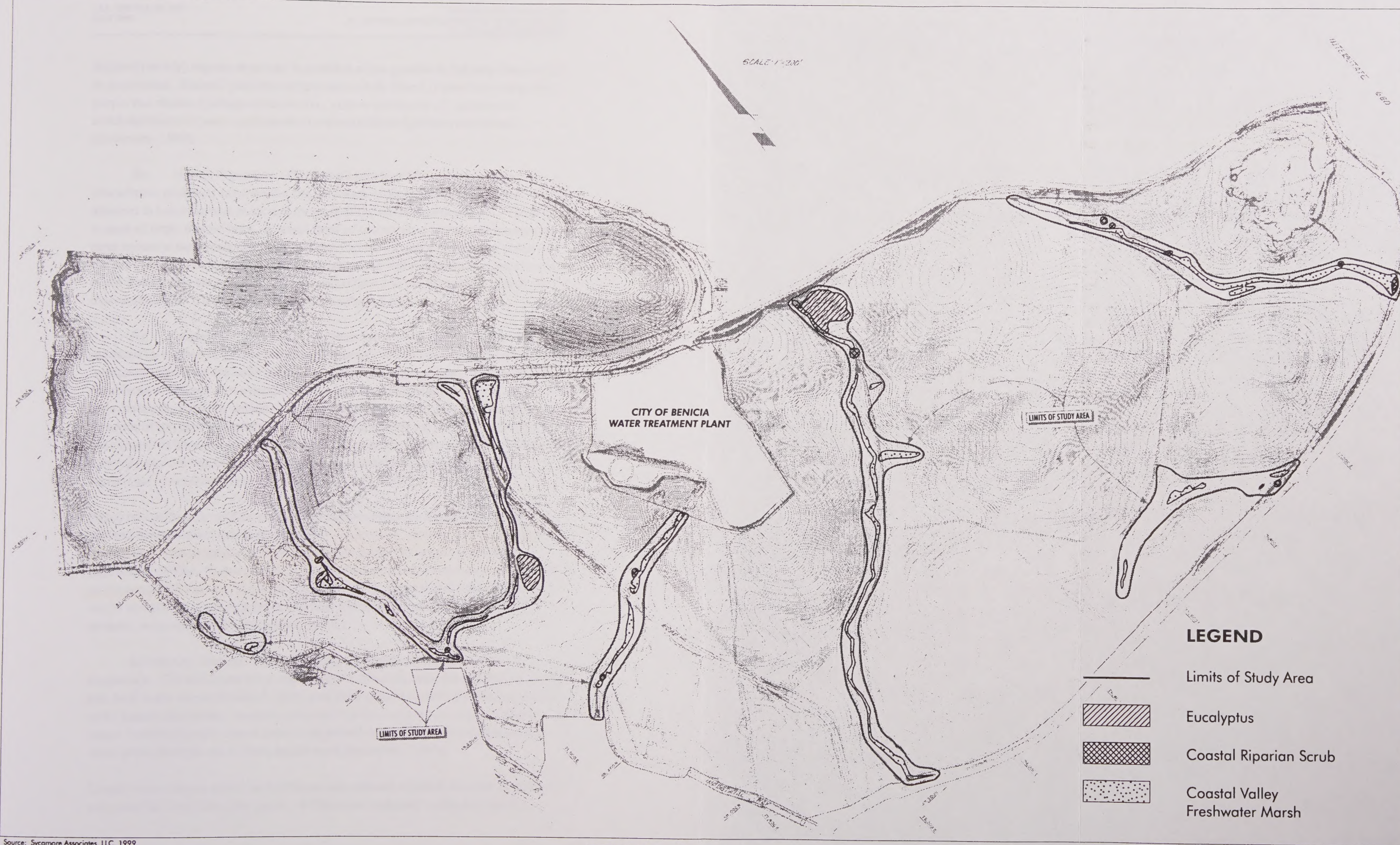
b. Existing Conditions. The Project site consists of low rolling hills, with elevations ranging from approximately 30 to 280 feet above mean sea level. The majority of the site is dominated by California annual (non-native) grassland. Wetland features present on the Project site consist of portions of four intermittent streams, several seeps and swales, and isolated seasonal wetlands. Water from these streams flows into Suisun Bay.

Woody vegetation present on the site consists of individuals and small stands of introduced and native trees.

(1) Vegetation. The vegetation types discussed in this report conform, to the extent possible, to the plant communities as classified in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995) and *Preliminary Description of the Terrestrial Natural Communities of California* (Holland 1986). The scientific names of plants discussed are those published in *The Jepson Manual: Higher Plants of California* (Hickman 1993). Vegetation types are shown in Figure IV.E-1.

(a) *California Annual Grassland.* The majority of the site supports California annual grassland (non-native grassland). The grassland areas have been used for livestock grazing. This plant community is characterized by a cover of non-native annual grasses, though native and non-native wildflowers (forbs) and native grasses occur in the grassland on-site. The dominant grasses on the Project site are brome grasses (*Bromus diandrus*, *B. madritensis* ssp. *rubens*), wild barley (*Hordeum murinum* ssp. *leporinum*, *H. marinum* ssp. *gussoneanum*), wild oats (*Avena* spp.), medusa-head grass (*Taeniatherum caput-medusae*) and Italian wildrye (*Lolium multiflorum*). Native grass species occurring on the site include creeping wild-rye (*Leymus triticoides*), which occurs in several places, especially in the northeast section of the site. Native purple needlegrass (*Nassella pulchra*) was reported from the site, but was not mapped as a representative of a sensitive community (Sycamore, 1999).

Both native and non-native forbs are interspersed throughout the grassland, including: bellardia (*Bellardia trixago*), rough cat's ear (*Hypochaeris radicata*), California poppy (*Eschscholzia californica*), filarees (*Erodium* spp.), hedge parsley (*Torilis nodosa*), bur-clover (*Medicago polymorpha*), purple owl's-clover (*Castilleja exserta*), narrow-leaved mule ears (*Wyethia angustifolia*), blue-eyed grass (*Sisyrinchium bellum*), Ithuriel's spear (*Triteleia laxa*), lupine (*Lupinus* spp.) and hayfield tarweed (*Hemizonia congesta*) (Sycamore, 1999).



Source: Sycamore Associates, LLC, 1999.

BENICIA BUSINESS PARK

LSA

Figure IV.E-1
Plant Communities

Ruderal (weedy) vegetation occurs in portions of the grassland, forming dense stands in some areas. Ruderal plant species present include fennel (*Foeniculum vulgare*), purple star-thistle (*Centaurea calcitrapa*), yellow-star thistle (*C. solstitialis*), artichoke thistle (*Cynara cardunculus*) and milk thistle (*Silybum marianum*) (Sycamore, 1999).

(b) *Woody Vegetation.* Three small stands of bluegum eucalyptus (*Eucalyptus globulus*) occur on the site, two west of Reservoir Road and one adjacent to Lake Herman Road and just east of the water treatment plant. These consist of large, mature trees. A small stand of unidentified introduced ornamental trees occurs at the abandoned farm building complex at the southwestern corner of the site (Lot 29). Individual and small stands of red willows (*Salix laevigata*) occur in the intermittent streams and seeps on and adjacent to the Project site, which are discussed below. There are no shrubs on the Project site.

(c) *Streams and Wetlands.* Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration of sufficient length to support vegetation typically adapted to saturated soil conditions. An area is considered a wetland if it is ponded, or the soils are saturated, for a minimum of 14 days during the growing season. Under these conditions, the soils become anaerobic (absence of oxygen) influencing the species composition and creating reducing conditions, which result in the development of unique soil characteristics such as gleying (gray colors), bright mottles and/or low matrix chroma, and iron and manganese concretions (Environmental Laboratory 1987).

Based on results of a verified wetland delineation prepared for the Project site, wetland habitats encompass approximately 7.4 acres of wetlands and 0.17 acre of unvegetated stream channel that are potentially subject to Corps jurisdiction (Sycamore, 1997a). These consist of intermittent streams, several seeps and swales, and two isolated seasonal wetlands (Figure IV.E-1). Coastal and valley freshwater marsh and central coast riparian scrub plant communities are associated with the streams, seeps and swales (Sycamore, 1997a).

Intermittent Streams. Portions of four intermittent streams occur on the Project site. The dominant plant community in the creek channels consists of coastal and fresh water marsh (Holland 1986), and plant species present includes iris-leaved rush (*Juncus xiphioides*), creeping spike-rush (*Eleocharis macrostachya*), three-square bulrush (*Scirpus americanus*), narrowleaf cattail (*Typha angustifolia*) and water cress (*Rorippa nasturtium-aquaticum*) (Sycamore, 1997a).

Central coast riparian scrub on the Project site consists of small, disturbed patches of mature red willow (*Salix laevigata*). Willows are restricted to the downstream

portions of the creek channels, at and outside the Project boundaries (Sycamore, 1997a). Individual willows occur in the upper portion of the northeastern stream.

Seeps and Swales. Dominant vegetation in the seeps and swales include iris-leaved rush, creeping spike rush, coast clover (*Trifolium wormskioldii*), curly dock (*Rumex crispus*), perennial ryegrass (*Lolium perenne*), mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), water buttercup (*Ranunculus aquatilis* var. *capillaceus*), and buttercup (*R. muricatus*).

Seasonal Wetlands. Two isolated seasonal wetlands occur at the western edge of the Project site, consisting of shallow depressions. Vegetation in these depressions is dominated by African brass-buttons (*Cotula coronopifolia*) and perennial ryegrass. Other plants present include buttercup, stipitate popcorn-flower (*Plagiobothrys stipitatus* var. *micranthus*), California water-starwort (*Callitriche marginata*), water pigmy-weed (*Crassula aquatica*), loosestrife (*Lythrum hyssopifolia*), and curly dock (Sycamore Assoc. LLC 1997a).

(2) Wildlife Values. Wildlife species present on the Benicia Business Park Project site are those species adapted to grassland habitats. Wildlife species observed, or evidence of their presence observed (*i.e.*, droppings, dens, and tracks), on and in the vicinity of the site, during the site visits in August 1999, were birds and mammals discussed below. The common names of birds are standardized in the American Ornithologist's Union *Check-List of North American Birds*, 7th ed. (1998).

(a) *Wildlife Supported by California Annual Grassland.* Grasslands provide habitat for a relatively small number of wildlife species, because of the uniform structure of vegetation. However, the grassland on the site supports populations of small lagomorphs (rabbits) and rodents, including black-tailed jackrabbit (*Lepus californicus*) and California vole (*Microtus californicus*), which provide an important prey base for avian and mammalian predators such as red-tailed hawk, great horned owl and coyote (*Canis latrans*).

Birds observed on the Project site include turkey vulture, northern harrier, red-tailed hawk, American kestrel, rock dove, mourning dove, barn swallow, cliff swallow, black phoebe, northern mockingbird, loggerhead shrike, European starling, red-winged blackbird, western meadowlark, and house finch. Mammals observed were black-tailed jackrabbit, California vole, coyote, and black-tailed deer (*Odocoileus hemionus columbianus*) (scat).

The turkey vulture, red-tailed hawk, American kestrel and great horned owl are wide ranging species that would include the Project site in their search for food.

Likewise, deer and coyotes from the larger open spaces north of the site could include the site as part of their foraging habitat.

The larger eucalyptus trees provide nesting habitat for raptors and other birds. One large raptor nest was found in the eucalyptus trees in the northwestern portion of the Project site.

(3) Sensitive Plant Communities and Habitats. Southern Solano County supports several sensitive plant communities and habitats. Agricultural, commercial, and residential development has reduced the extent of some plant communities and habitats originally occurring in the region, resulting in a decline in the numbers of individuals of some plant and wildlife species.

Sensitive plant communities and habitats present on the site are the intermittent streams, seeps and swales, and seasonal wetlands. These are described in the vegetation section, above. The wetlands and waters of the United States are potentially subject to Corps jurisdiction.

(4) Special-Status Species. Several special-status plant and wildlife species are known to occur in the general vicinity of the Project site. Special-status species are defined as species that are officially listed by the California Department of Fish and Game (CDFG) or the United States Fish and Wildlife Service (USFWS) as threatened or endangered; are candidate species for listing; are California species of special concern; or are included on Lists 1B and 2 in the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994).

(a) Special-Status Plants. Information from surveys for special-status plant species in wetland habitats at the Project site (Sycamore, 1997b) and in upland habitats on the Project site (Sycamore, 1999), and the CNDDDB (CDFG 1999) was used to identify 46 special-status plant species that potentially occur in the general vicinity of the Project site. Of the 46 potentially occurring species, 25 plant species were determined to be absent from the site either because of lack of suitable habitat or absence of observations during appropriately timed surveys. Twenty-one other species were determined to have a low potential for occurrence, but could not be totally discounted because marginal habitat occurs on-site and the plants may not have been observable at the time of the botanical surveys.

Table IV.E-1 shows the 21 special-status plant species that could occur on the Project site. The table summarizes the scientific name, legal/protective status, habitat requirements, blooming period and potential for occurrence for these species. These species could in the grasslands and/or the wetlands on the Project site (Sycamore Assoc. LLC 1999). Contra Costa goldfields (*Lasthenia conjugens*), Crampton's tuctoria (*Tuctoria mucronata*), and Colusa grass (*Neostapfia colusana*) are listed federally as endangered or threatened species. In addition, Boggs Lake hedge-hyssop (*Gratiola heterosepala*), Colusa grass, and Crampton's tuctoria are listed as endangered by the State of California. Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*) is a federal candidate for listing as threatened or endangered. The CNPS status of the remaining plants can be viewed in the table.

(b) **Special-Status Wildlife.** Information from the CNDDB (CDFG 1999), site reconnaissance and professional experience of wildlife resources in the Project vicinity indicates the potential presence of 22 special-status wildlife species. Six wildlife species reported in the CNDDB occur in tidal salt marsh habitats in Suisun Marsh, and would not occur on the Project site because of the absence of this habitat type on-site. These are California black rail (*Laterallus jamaicensis coturniculus*), California clapper rail (*Rallus longirostris obsoletus*), salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), Suisun song sparrow (*Melospiza melodia maxillaris*), Suisun shrew (*Sorex ornatus sinuosus*) and salt marsh harvest mouse (*Reithrodontomys raviventris*).

Table IV.E-2 summarizes those special-status wildlife species that could occur on the Project site, their scientific names, and State and federal status.

Fairy Shrimp. The Project site is within the general range of two species of special-status fairy shrimp: Conservancy fairy shrimp (*Branchinecta conservatio*) and vernal pool fairy shrimp (*B. lynchi*). The Conservancy fairy shrimp has been listed federally as an endangered species and the vernal pool fairy shrimp is listed federally as a threatened species. They do not have any state listing status.

Surveys for fairy shrimp were not conducted on the Project site. There are no vernal pools on the Project site but the seasonal wetlands on the site provide marginal habitat for fairy shrimp.

The distribution of the two special-status fairy shrimp present in the vicinity is summarized below.

Table IV.E-1
SPECIAL-STATUS PLANT SPECIES POTENTIALLY OCCURRING
ON THE BENICIA BUSINESS PARK SITE

Species (Scientific Name/Common Name)	Status Fed/State/CNPS	Habitat/Blooming Period	Potential for Occurrence
<i>Astragalus tener</i> var. <i>ferrisiae</i> Alkali milk-vetch	SC/-1B	Mesic meadows, grasslands on sub-alkaline flats. April-May	Possible, in grasslands.
<i>Atriplex depressa</i> Brittlescale	-/-1B	Chenopod scrub, playas, and Valley/foothill grassland on alkaline soils. May-Oct	Possible, in grasslands.
<i>Atriplex joaquiniana</i> San Joaquin spearscale	SC/-1B	Chenopod scrub, Valley/foothill grassland, and alkali meadows. April-Sept	Possible, in grasslands.
<i>Atriplex coronata</i> var. <i>coronata</i> Crownscale	-/-4	Chenopod scrub, Valley/foothill grassland on alkaline soils. April-Oct	Possible, in grasslands.
<i>Atriplex codulata</i> Heartscale	SC/-4	Chenopod scrub, Valley/foothill grassland on alkaline or saline hard-packed soils. May-Oct	Possible, in grasslands.
<i>Blepharizonia plumosa</i> ssp. <i>plumosa</i> Big Tarweed	--/--1B	Dry grassland: July-October.	Possible, in grassland on-site.
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i> Soft bird's beak	SC/-1B	Meadows, playas, Valley/foothill grassland on alkaline sites. June-Sept	Possible in grasslands.
<i>Downingia pusilla</i> Dwarf downingia	-/-2	Mesic sites in Valley/foothill grassland and vernal pools. Mar-May	Possible, in wetlands.
<i>Fritillaria liliacea</i> Fragrant Fritillary	--/--1B	Grassland, coastal scrub, often on clay or serpentine: February-April.	Possible, in grassland on-site.
<i>Fritillaria pluriflora</i> Adobe Lily	--/--1B	Grassland, chaparral and woodland, often of clay soils: February-April.	Possible, in grasslands on-site.
<i>Gratiola heterosepala</i> Boggs Lake hedge-hyssop	-/CE/1B	Marshes along lake margins, vernal pools on clay. Apr-Aug	Possible, in wetlands.
<i>Hemizonia parryi</i> ssp. <i>congdonii</i> Congdon's Tarplant	FC/--1B	Grassland, often in alkaline soils: June-November.	Possible, in grassland on-site.
<i>Lasthenia conjugens</i> Contra Costa Goldfields	FE/--1B	Moist sites in grasslands and vernal pools: March-June.	Possible, in grassland on-site
<i>Legenere limosa</i> Legenere	SC/-1B	Vernal pools. May-June	Possible, in wetlands.
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia	-/-1B	Cismontane woodland, lower montane coniferous forest, mesic meadows, Valley/foothill grassland, vernal pools. May-July	Possible, in wetlands.
<i>Neostapfia colusana</i> Colusa grass	FT/CE/1B	Restricted to large, northern claypan vernal pools with alkaline soils. May-July	Unlikely, no vernal pools on-site, but no survey at the appropriate time
<i>Perideridia gairdneri</i> spp. <i>gairdneri</i> Gairdner's Yampah	--/--4	Moist sites in grassland, scrub and woodlands: June-October.	Possible in grassland on-site.
<i>Plagiobothrys hystriculus</i> Bearded popcorn-flower	-/-1A	Vernal pools and mesic Valley/foothill grassland. Apr-May	Possible, in wetlands.
<i>Psilocarphus tenellus</i> var. <i>globiferus</i> Round Woolly-marbles	--/--4	Coastal dunes, vernal pools: April-May.	Possible, in wetlands on-site.
<i>Psilocarphus brevissimus</i> var. <i>multiflorus</i> Delta woolly-marbles	-/-4	Vernal pools. May-June	Possible, in wetlands.

Table IV.E-1 *continued*

Species (Scientific Name/Common Name)	Status Fed/State/CNPS	Habitat/Blooming Period	Potential for Occurrence
<i>Tuctoria mucronata</i> Crampton's Tuctoria	FE/CE/1B	Vernal pools. April-July	Unlikely, no vernal pools on-site, but no survey at the appropriate time.

Status:

- FE Federal listed as an endangered species.
- FT Federal listed as a threatened species.
- FC Federal candidate for listing as threatened or endangered.
- SC Federal species of concern.
- CE Listed as endangered species by the State of California
- 1A CNPS List 1A – Plants presumed extinct in California.
- 1B CNPS List 1B – Plants that the CNPS considers rare and endangered in California and elsewhere.
- 4 CNPS List 4 – Plant of limited distribution.
- No listing status.

Table IV.E-2
SPECIAL-STATUS WILDLIFE SPECIES POTENTIALLY
OCCURRING ON THE BENICIA BUSINESS PARK SITE

Species	Status (Federal/State)	Potential for Occurrence
Conservancy Fairy Shrimp (<i>Branchinecta conservatio</i>)	FE/--	Not likely. Typically found in large, turbid vernal pools. No suitable habitat on-site.
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	FT/--	Not likely. Seasonal wetlands provide only marginal habitat for this species.
California Tiger Salamander (<i>Ambystoma californiense</i>)	FC/CSC,SP	Not likely. No breeding habitat on-site and upland retreat habitat may be marginal.
California Red-legged Frog (<i>Rana aurora draytonii</i>)	FT/CSC,SP	Not likely. No breeding habitat on-site. Creeks could provide movement corridors.
Western Pond Turtle (<i>Clemmys marmorata</i> ssp)	--/CSC,SP	Possible in creeks on-site.
White-tailed kite (<i>Elanus leucurus</i>)	--/SP	Possible. Observed off-site and could nest in trees on-site.
Northern Harrier (<i>Circus cyaneus</i>)	--/CSC	Observed. Not likely to nest in grassland on-site because of heavy grazing.
Ferruginous Hawk (<i>Buteo regalis</i>)	--/CSC	Possible. Site could provide winter foraging habitat.
Golden Eagle (<i>Aquila chrysaetus</i>)	--/CSC,SP	Possible. No nesting detected; site could provide foraging habitat.
Burrowing Owl (<i>Athene cunicularia</i>)	--/CSC	Possible. Could nest if California ground squirrel burrows are present.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	--/CSC	Observed. Could nest in trees on-site.
Tricolored Blackbird (<i>Agelaius tricolor</i>)	--/CSC	No nesting habitat on-site. Nesting colonies near site could forage on-site.
Pale Big-eared Bat (<i>Corynorhinus townsendii pallescens</i>)	--/CSC	Possible. Could roost in abandoned buildings on-site.
Greater Western Mastiff Bat (<i>Eumops perotis</i>)	--/CSC	Possible. Could roost in abandoned buildings on-site.
Pallid Bat (<i>Antrozous pallidus</i>)	--/CSC	Possible. Could roost in abandoned buildings on-site.

Status

- FE Federally listed as an endangered species.
 FT Federally listed as a threatened species.
 FC Federal candidate for listing as threatened or endangered.
 CSC California species of special concern.
 SP California protected species.
 -- No listing status.

- **Conservancy Fairy Shrimp.** The Conservancy fairy shrimp occurs in a few disjunct vernal pools in grasslands of the northern two-thirds of the Central Valley, including the Vina Plains of Tehama County; Sacramento National Wildlife Refuge in Glenn County; Jepson Prairie Preserve and surrounding areas immediately east of Travis Air Force Base, Solano county (Eriksen and Belk 1999). This species typically is found in large, turbid vernal pools. Conservancy fairy shrimp are unlikely to occur on the site because of the absence of vernal pools.
- **Vernal Pool Fairy Shrimp.** Vernal pool fairy shrimp occur in a variety of seasonal freshwater pools, including vernal pools, rock outcrops and swales, throughout the Central Valley and foothills of California as well as the Los Angeles Basin (Eriksen and Belk 1999). Seasonal wetlands onsite, although providing marginal habitat, are unlikely to support this species.

California Tiger Salamander. The California tiger salamander (*Ambystoma californiense*) is a federal candidate for listing as threatened or endangered (Priority 8). It is a California species of special concern.

The California tiger salamander is found in grassland and oak woodland habitats of the Central Valley and coastal hills and valleys from Santa Rosa southward to the Santa Rita Hills (Stebbins 1985). The adults emerge from their summer dormancy period after the first autumn rains to mate and lay their eggs in vernal pools, stock ponds, pools in drainages, and other ephemeral waterbodies where fish and other species that prey on the eggs and larvae of tiger salamanders are absent. After hatching, the larvae remain in the water while developing into the adult form. During the spring and summer months, when pools and ponds dry up, the juvenile salamanders disperse to rodent burrows and other underground retreats to survive the summer heat (Stebbins 1985).

California tiger salamanders were not observed on the site and no habitat occurs on-site that would support breeding populations. The site may be of limited value as upland retreat habitat for tiger salamanders because of the absence of California ground squirrel burrows which the salamander uses for protection. California tiger salamanders are not expected to occur on the Project site.

California Red-legged Frog. The California red-legged frog (*Rana aurora draytonii*) is listed federally as a threatened species. It is a California species of special concern.

The California red-legged frog occurs in the Sierra Nevada and northern and southern coastal hills and valleys of California and northwestern Baja California. The species is apparently no longer present in the Central Valley (Stebbins 1985). It

is found in marshes, streams, lakes, reservoirs, ponds, and other, usually permanent, sources of water. It is chiefly a pond frog that inhabits humid forests, woodlands, grasslands, and stream sides. It is generally found in or near water, but disperses after rains and may appear in damp woods and meadows far from water (Stebbins 1985). The breeding period is from January through April, depending on locality (Stebbins 1985).

Surveys for red-legged frogs were initiated in the spring of 1999 as part of this Master Plan application, but have not yet been completed. No red-legged frogs were found during the spring survey (M. Wood, pers. com.). Red-legged frogs have been found about 5 miles north of the site, in the Sky Valley area (CDFG 1999). The intermittent streams on the site could potentially support individual red-legged frogs dispersing from breeding habitats present off-site.

Western Pond Turtle. The Project site is within the area of intergradation of the two subspecies of western pond turtle, the southwestern pond turtle (*Clemmys marmorata pallida*), and the northwestern pond turtle (*C.m. marmorata*). Both subspecies are California species of special concern. They have no federal status.

The western pond turtle ranges from western Washington State, south to northwestern Baja California. In California, the northwestern pond turtle occurs from San Francisco Bay and the Sacramento/San Joaquin River Delta, northward. The southwestern pond turtle occurs in the coastal hills and valleys, from San Francisco southward to northwestern Baja California, in the coastal hills and valleys (Stebbins 1985). The San Joaquin Valley, from the Delta southward is in an area of intergradation between the two subspecies.

The pond turtle is an aquatic species, found in ponds, marshes, rivers, streams, and irrigation ditches that typically have rocky or muddy bottoms and are vegetated with watercress (*Rorippa nasturtium-aquaticum*), cat-tails (*Typha* sp.), and other aquatic vegetation (Stebbins 1985). They are found in ponds and drainages year-round within woodlands, grasslands, and open forests. Eggs are laid in upland habitat from April through August (Stebbins 1985).

Pond turtles were not observed on the site. Pond turtles are not likely to occur on the site because the streams are intermittent and are not connected with suitable pond turtle habitat.

White-tailed Kite. The white tailed kite (*Elanus leucurus*) has no state or federal status. However, it is fully protected by the state. White-tailed kites are year-round residents, and nest and roost in large groves of dense, broad-leaved trees, located near suitable foraging habitat (Zeiner, et al. 1990). They forage for small

rodents in grassland and other open habitats. The CNDDDB (1999) has no records of white-tailed kite nesting in the Project vicinity. However, one white-tailed kite was observed about a mile west of the Project site during a site visit conducted on August 5, 1999 as part of this evaluation. The eucalyptus trees on-site could provide nesting habitat for white-tailed kites and the grassland provides suitable foraging habitat for white-tailed kites that could nest in the Project vicinity.

Northern Harrier. The northern harrier (*Circus cyaneus*) is a California species of special concern. It has no federal status. The CDFG has concerns about the decline of northern harrier nesting habitat.

Northern harrier breed in fresh and saltwater emergent wetlands, and grasslands, in the Central Valley, and coastal valleys, from Oregon, southward. Nests are located on the ground in areas of tall dense grasses or shrubs, usually near marsh edges. They nest from April to September (Zeiner et al. 1990).

One northern harrier was observed foraging on the Project site during a site visit conducted for this evaluation. Because of the extent of historic disturbance to the site, they are not likely to nest on-site. However, northern harriers wintering, or nesting, in the general area could include the Project site as part of their foraging range.

Ferruginous Hawk. The ferruginous hawk (*Buteo regalis*) is a California species of special concern. It has no federal status. The ferruginous hawk does not nest in California (Mallett and Gould 1976). However, the CDFG has concerns about the loss of ferruginous hawk winter foraging habitat.

In California, ferruginous hawks winter in the arid plains and open rangeland along the western edge of the Central Valley, in open valleys in the inner Coast Ranges, and in the deserts of southern California. The species is not known to breed in California. The species primarily feeds on small to medium-sized mammals (Mallett and Gould 1976).

Ferruginous hawks were not observed on the Project site. However, ferruginous hawks have been observed in the Cordelia Slough area, about 4 miles northeast of the Project site (Schmoltdt pers. obs.). The open grassland on and adjacent to the site provides suitable foraging habitat for ferruginous hawks. However, because of the apparent absence of California ground squirrels, the hawks primary prey species, ferruginous hawks may not forage regularly on the Project site.

Golden Eagle. The golden eagle (*Aquila chrysaetos*) is a California species of special concern. The species has no federal status. However, the golden eagle is protected under the federal Bald Eagle Protection Act.

The golden eagle occurs throughout much of California, particularly in hilly regions dominated by grassland and oak savannah. The golden eagle is a large, wide ranging predator of open grassland and savanna habitats in hilly country. Golden eagles nest on cliff faces and in large trees. Nests are large structures that are used for many years, by the same pair and often subsequently by other eagles (Palmer 1988). The breeding territories of the golden eagle can range from 20 to 60 square miles (Mallette and Gould 1976). The species feeds primarily on medium sized mammals.

No golden eagles were observed on the Project site and no large nests typical of golden eagles occur on the site. The CNDDDB (CDFG 1999) has a record of golden eagles nesting in eucalyptus trees near the junction of Highway 37 and Highway 80, approximately 6 miles west of the Project site, and golden eagles have been observed in the Sky Valley area about 5 miles northwest of the site (Schmoltd/pers. obs.). Golden eagles may nest in the Project vicinity and include the Project site as part of their foraging range.

Burrowing Owl. The burrowing owl (*Athene cunicularia*) is a California species of special concern. It has no federal status.

The burrowing owl occurs in agricultural and urban areas that support populations of California ground squirrels. The burrowing owl nests in ground squirrel burrows and feeds on insects and small mammals (Mallette and Gould 1976).

Burrowing owls were not observed on the Project site. Because of the apparent absence of California ground squirrel burrows on the site, burrowing owls may not occur on the Project site. However, the grasslands on-site could provide foraging habitat for this species.

Loggerhead Shrike. The loggerhead shrike (*Lanius ludovicianus*) is a California species of special concern. It has no federal status.

The loggerhead shrike is a common resident and winter visitor in the lowlands throughout California. It prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, and other perches. It occurs only rarely in heavily urbanized areas. They feed primarily on large insects and small birds and mammals. They nest from March to August (Zeiner, et al. 1990).

Three loggerhead shrikes were observed on and adjacent to the Project site. The woody vegetation present on and adjacent to the site could provide nesting habitat

for loggerhead shrikes and the grassland provides suitable foraging habitat for this species.

Tricolored Blackbird. The tricolored blackbird (*Agelaius tricolor*) is a California species of special concern. It has no federal status.

Tricolored blackbirds are highly colonial and nomadic and are largely endemic to the lowlands of California. Breeding is highly synchronized, with most pairs in a colony initiating nesting within a few days of each other. The synchronization and colonial breeding may have evolved as an adaptation to a rapidly changing environment where the locations of secure nesting habitat and food supplies were likely to change each year (Beedy et al. 1991). They prefer to nest in freshwater marshes with dense growths of emergent vegetation, but will nest in upland locations that support dense stands of herbaceous vegetation, especially plant species that are armed with thorns or spines (Beedy et al. 1991 and Beedy pers. comm.). They nest from mid-April through mid-July. They will travel up to four miles to forage (Zeiner et al. 1990).

Tricolored blackbirds were not observed on the Project site. There is no breeding habitat on the site for this species and tricolored blackbirds would not nest on the Project site. The CNDDB (CDFG 1999) has records of tricolored blackbirds nesting near Vallejo, about 6 miles west of the site and small numbers of tricolored blackbirds have been observed at Lake Herman, about 1 mile northwest of the site (Beedy, et al. 1991). The Project site could potentially provide suitable foraging habitat for tricolored blackbirds that may nest in the area.

Western Big-eared Bat. Two subspecies of pacific western big-eared bat occur in California, the Pacific western big-eared bat (*Corynorhinus townsendii*) and the pale western big-eared bat (*C. t. pallescens*). Both sub-species are State species of special concern and have no federal status.

C.t. townsendii occurs in the humid coastal regions of northern and central California. *C.t. pallescens* occurs throughout the remainder of the state. Western big-eared bats live in a variety of habitats including coastal conifer and broad-leaf forests, oak woodlands, arid grasslands and deserts, and high elevation forests and meadows. It is most common in mesic sites within these communities (Williams 1986).

Western big-eared bats feed on insects which are captured in flight. They roost in colonies and form feeding, maternity, and hibernation roosting colonies. They roost in limestone caves, mine tunnels, buildings, and other human-made structures (Williams 1986). These roosting sites are used only when free of human disturbance. A single visit by humans can cause the bats to abandon a roost (Williams 1986).

No bats were observed incidentally on the Project site. The abandoned buildings in the northeastern portion of the Project site could provide roosting habitat for bats.

Greater Western Mastiff Bat. The greater western mastiff bat (=California mastiff bat) (*Eumops perotis*) is a California species of special concern. This species has no federal status.

Mastiff bats occur from central California (Butte County), southward to Mexico. They appear to favor rugged, rocky areas where crevices are available for day-roosts. The day-roosts are usually located in large cracks in exfoliated slabs of granite or sandstone that are downward facing. The crevices must open downward, be at least five centimeters wide and 30 centimeters deep, and must be at least two meters above the ground. They may roost in buildings that have structures similar to those described above (Williams 1986). Mastiff bats feed on insects which they capture in flight. They are large and must drop at least two to three meters to launch into flight (Williams 1986).

Mastiff bats were not found on the site. The abandoned buildings in the northeastern portion of the site may provide suitable roosting habitat for this species.

Pallid Bat. The pallid bat (*Antrozous pallidus*) is a California species of special concern. This species has no federal status.

Pallid bats occurs at low elevations throughout California and occupies a variety of habitats, including grasslands, shrublands and woodlands. It occurs most commonly in open, dry habitats with rocky areas for roosting, but will roost in caves, mines, hollow trees and buildings. They are known to roost with other bat species. Pallid bats feed on large, hard-shelled prey on the ground or in foliage (Zeiner, et al. 1990).

Pallid bats were not observed on the Project site. The abandoned buildings in the northeastern portion of the site may provide suitable roosting habitat for this species.

c. Regulatory Context

The Project site is within the general geographical range of several sensitive plant communities and special-status plant and wildlife species. Biological resources on the property may fall under agency jurisdictions and regulations described below.

(1) U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over formally-listed threatened and endangered species under the federal Endangered Species Act. This Act protects listed species from harm or "take", which is broadly defined as to "harass, harm, pursue, hunt, shoot,

wound, kill, trap, capture, or collect, or attempt to engage in any such conduct". An activity can be defined as a "take" even if it is unintentional or accidental.

An endangered species is one which is considered in danger of becoming extinct throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered within the foreseeable future. In addition to endangered and threatened species, which are legally-protected under the federal Endangered Species Act, the USFWS maintains a list of candidate species. Candidate species are specifically included on a list published in the federal register. Federal candidate species are not afforded legal protection under the federal Endangered Species Act.

(2) California Department of Fish and Game. The California Department of Fish and Game (CDFG) has jurisdiction over state-listed threatened and endangered species under the state Endangered Species Act. The state and federal lists are generally similar, although a few species present on one list may be absent from the other list. The state also maintains a list of special-status wildlife on its list of Species of Special Concern. Species on this list are generally not afforded legal protection.

The CDFG also exerts jurisdiction over the bed and banks of watercourses according to the provisions of Section 1601 to 1603 of the Fish and Game Code. They typically require a Streambed Alteration Permit for the fill or removal of any material from any natural drainage. The jurisdiction of the CDFG extends to the top of bank and often includes the outer edge of riparian vegetation canopy cover.

(3) California Native Plant Society. The California Native Plant Society (CNPS) has developed lists of plant species that they consider to be rare, threatened, or endangered in California (Skinner and Pavlik, 1994). Although the CNPS is not a formal regulatory agency, the species on their List 1B (plant species considered endangered in California and elsewhere) and List 2 (plant species considered rare, threatened or endangered in California, but common elsewhere) warrant analysis in CEQA documents. List 1A plants are considered extinct by the CNPS because they have not been observed despite focused searches. The Department of Fish and Game does not consider CNPS List 3 and List 4 plant species to be species that require CEQA analysis.

(4) U.S. Army Corps of Engineers. Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (Corps) is responsible for regulating the discharge of fill material into waters of the United States. Waters of the U.S. and their lateral limits are defined in 33 CFR Part 328.3 (a) and include streams that are tributary to navigable waters and their adjacent wetlands. Wetlands that are not

adjacent to waters of the U.S. are termed "isolated wetlands" and may be subject to Corps jurisdiction.

In general, a Corps permit must be obtained before placing fill in wetlands or other waters of the U.S. The type of permit depends on the acreage involved and the purpose of the proposed fill. Minor amounts of fill are sometimes covered by Nationwide Permits, in which wetland losses may be mitigated by creation of compensatory wetlands (after minimizing loss to the extent possible) and in which public review is not required. An Individual Permit is required for projects that result in more than a "minimal" impact on wetlands or other waters of the U.S. Individual Permits require evidence that wetland impacts have been avoided to the extent possible and a review of the Project by the public.

(5) Regional Water Quality Control Board. Pursuant to Section 401 of the Clean Water Act, projects that require a permit from the Corps under Section 404 must also obtain water quality certification from the Regional Water Quality Control Board (RWQCB). This certification ensures that the Project will uphold state water quality standards. The RWQCB may impose mitigation requirements even if the Corps does not.

(6) Benicia General Plan. The Benicia General Plan contains the following goals, policies and programs relative to protection of biotic resources.

Goal 3.19: Preserve and enhance habitat for special-status plants and animals.

Goal 3.20: Protect and enhance native vegetation and habitats.

Policy 3.20.1: Protect native grasslands, oak woodlands and riparian habitat.

Program 3.20.B: *Limit the loss of native vegetation or require mitigation, or both.*

Policy 3.20.3 Encourage preservation of existing trees. Especially preserve and protect mature, healthy trees whenever practicable, particularly where such trees are of significant size or are of significant aesthetic value to the immediate vicinity or to the community as a whole.

Goal 3.21: Permanently protect and enhance wetlands so that there is no net loss of wetlands within the Benicia Planning Area.

Policy 3.21.1: Encourage avoidance and enhancement of sensitive wetlands as part of future development.

Policy 3.21.2: Require replacement for wetlands eliminated as a result of development at a higher wetlands value and acreage than the area eliminated.

Program 3.21.E: Identify small wetlands and require their protection, restoration, and enhancement as part of open space dedication in proposed development and in citywide open space improvements.

2. Impacts and Mitigation Measures

a. Thresholds of Significance. The significance criteria related to biological resources follow *CEQA Guidelines* (Section 15065). The Project's effects on biological resources would be considered significant if the Project would:

- Create direct biological impacts associated with inconsistency with General Plan policies;
- Substantially diminish habitat for fish, wildlife, or plants or threatens to eliminate a plant or animal community;
- Substantially affect a rare, threatened, or endangered plant or animal species (including those species that meet the definition of rare and endangered according to CEQA);
- Interfere substantially with the movement of any resident or migratory fish or wildlife species;
- Cause a fish or wildlife population to drop below self-sustaining levels; or
- Create runoff that significantly impacts unique plant communities and wildlife habitat.

b. Summary. The proposed Project may result in potential impacts to jurisdictional wetlands, special-status plant and animal species, amphibious herptiles, white-tailed kite and other nesting raptors, burrowing owl, loggerhead shrike, fairy shrimp and special-status bats. In addition, the Project could result in potential indirect impacts to Suisun Marsh due to project-related pollutants that could enter the marsh via storm drains and watercourses. The mitigation measures proposed in this EIR would reduce impacts of all of these resources to less-than-significant levels.

c. Less-than-Significant Impacts.

(1) General Plan Policies. The loss of wetlands on the site would be inconsistent with the General Plan Goal 3.21 to permanently protect and enhance wetlands so that there is no net loss of wetlands within the Benicia Planning Area. The General Plan Policy 3.21.2 also requires replacement of lost wetlands at a higher wetlands value and acreage than the area eliminated. The project proposes to replace wetlands at a 2:1 ratio. Impacts to wetlands are discussed below under Significant Impacts and Mitigation Measures, Impact BIO-1.

Goal 3.19 promotes preserving habitat for special status species. Potential impacts to special status species are discussed below under Impacts BIO-3 through BIO-6.

General Plan Goal 3.20, Policy 3.20.1, Program 3.20.B, and Policy 3.20.3 address preservation and protection of native vegetation. The Project preserves steep hillsides as open space. Approximately one-third of the site is proposed for retention as open space. The project proposes to retain mature trees and also preserves vegetation along major riparian corridors within the project site. In addition, the wetland mitigation plan proposed by the project would replace wetland vegetation lost as a result of development.

(2) Migratory Wildlife. The proposed Project would not interfere substantially with the movement of any resident or migratory fish or wildlife species.

(3) Birds. Northern harrier, ferruginous hawk, and golden eagle are not expected to nest on the Project site. However, it is likely that these, and other raptors, forage here for prey on an occasional basis. Because of the presence of large areas of existing open space in the Project vicinity, potential impacts to foraging raptors would be less than significant.

Impacts to loggerhead shrike are not expected to be significant because of the extent of undeveloped land that could provide foraging and nesting habitat for loggerhead shrike in the Project vicinity.

The project could result in the cumulative loss of foraging habitat for tricolored blackbirds. However, impacts to tricolored blackbirds are not expected to be significant because of the absence of nesting habitat and the extent of undeveloped land that could provide foraging habitat for tricolored blackbirds in the Project vicinity. No mitigation measures are required.

(4) Amphibians. Impacts to California tiger salamander are not expected to be significant because of the absence of breeding and upland shelter habitat on the site, and the extent of undeveloped land in the Project vicinity.

The intermittent streams on-site could provide foraging, cover, and hydration habitat for California red-legged frog and western pond turtle. No breeding habitat for these species occurs on-site. Surveys of all creeks and wetlands within the Project site were conducted to determine the value of red-legged frog habitat and the likely use of the site by red-legged frog (Sycamore, 1999a). Surveys were conducted during both daylight and night hours in 1999, but no California red-legged frogs were detected during any of the surveys. The only amphibians detected during the surveys were calling male Pacific treefrogs (*Hyla regilla*) and their larvae. Pacific treefrogs were detected in many of the aquatic habitats on site. The letter report of the survey (Sycamore, 1999a) concludes that the site is unsuitable for California red-legged frog due to the fact that virtually all of the aquatic habitats (e.g., the plunge pools in the creek channels) dry up by mid-summer. The three seeps and watercourses still wet during the summer months are very shallow (less than three inches deep). Standing water available in the summer time is muddy and is subject to heavy tramping by livestock. Because the site has a long history of livestock grazing during all seasons the likelihood of red-legged frog occurring on site is considered to be very low (Sycamore, 1999a). The last known record for the species in the area was captured in 1915. Given the long history of use of the lands in the vicinity for livestock grazing, it is expected that the species has been extirpated.

Pond turtles were not observed on the site. Pond turtles are not likely to occur on the site because the streams are intermittent and are not connected with suitable pond turtle habitat.

d. Significant Impacts and Mitigation Measures.

Impact BIO-1: The proposed project would result in the fill of 4.56 acres of jurisdictional wetlands and 0.13 acres of other waters of the U.S. (S)

See the Project Description and Figure III-8 in Chapter III of this EIR for a discussion of on-site wetlands proposed for retention and/or enhancement.

The development area contains about 7.6 acres of wetlands and waters of the United States that are subject to Corps jurisdiction, of which 4.69 acres will be filled during the project. An additional 1.8 acres of freshwater marsh will be temporarily disturbed during creation of the mitigation wetlands. Impacts to the 1.8 acre of freshwater marsh are temporary, and the marsh will be restored in place at a 1:1 ratio. These 1.8 acres are not counted in the 9.43 acres to be created or in the 4.69

acres to be filled (Sycamore, 2000).¹ These wetland features, consisting of intermittent streams, several seeps and swales, and two isolated seasonal wetlands, have been verified by the Corps (Corps File No. 18366E). Impacts to these wetlands and waters of the United States would constitute a significant impact.

Mitigation Measure BIO-1a: The project proponent shall obtain the appropriate federal and state permits authorizing fill of wetlands or waters and work in streams in compliance with all terms and conditions of the permits.

Mitigation Measure BIO-1b: The project proponent shall implement the wetland mitigation and monitoring plan (Sycamore, 2000) as mitigation for impacts to jurisdictional wetlands. This plan, in its entirety, is incorporated into this mitigation measure by reference. This plan details the mitigation design, wetland planting design, maintenance and monitoring requirements, reporting requirements, and success criteria. This plan must be approved by the Corps and the City prior to implementation.

A total of 9.43 acres of in-kind jurisdictional wetland habitat will be created on-site, consisting of approximately 3.17 acres of willow scrub habitat and 6.3 acres of freshwater marsh/seasonal wetlands. This represents a mitigation ratio of slightly over 2:1. As detailed in the plan, created wetlands will be monitored for a minimum of 5 years. Annual monitoring of each site will include 1) observation of existing and developing problems and recommendations for remedial actions; 2) an assessment of creation of wetland habitats; 3) a formal wetland delineation in year 5; 4) notation of invasive exotic species; 5) measurement of willow survival ; and 6) photo-documentation. Monitoring visits will be made in the winter and spring of each year and quantitative data will be collected in the spring. Annual reports will be submitted each fall to the Corps and the City for review. At the end of the 5-year monitoring period, the Corps and the City will review the reports and determine if the success criteria have been met. If the success criteria have not been achieved, then the maintenance and monitoring period may be extended until such time as the success criteria are met.

Mitigation Measure BIO-1c: During construction, wetlands to be preserved shall be clearly marked with flagging and /or construction fencing. The project restorationist shall be on-site during construction to provide direction and ensure protection of sensitive resources.

¹ The Sycamore Associates Wetland Mitigation and Monitoring Plan for the project site (January 2000) is available under separate cover at the City of Benicia Planning Department.

Mitigation Measure BIO-1d: During project construction, no material shall be allowed to enter, or be stored, in any wetlands that are to be preserved. Project related dirt and other material shall be kept sufficiently far away from preserved wetlands and drainages to prevent material from entering these features. If earthmoving activities or material stockpiling occurs upslope from a preserved wetland or drainage, silt fencing will be installed around the preserved feature to prevent soil from entering the wetland or drainage. Silt fencing shall be installed at the least 5 feet from the edges of preserved wetlands and drainages. Silt fencing should also be installed around preserved features whenever earthmoving activities or material stockpiling occurs within 20 feet of a preserved feature. All equipment washing will occur downslope from preserved wetlands to prevent the run-off from entering the preserved wetlands. Berms or other barriers be constructed outside of preserved wetlands or drainages to prevent wash water run-off from entering the preserved wetlands.

Mitigation Measure BIO-1e: Upon project completion, all preserved and created wetland areas shall be revegetated with locally adapted, native plant species as described in the approved wetland mitigation and monitoring plan (Sycamore, 2000).

Mitigation Measure BIO-1f: A conservation easement shall be established around the created wetlands to preserve these wetlands in perpetuity. The City or other public resource agency shall hold the easement to ensure retention of this land in perpetuity.

Mitigation Measure BIO-1g: The project proponent shall provide financial assurances of a type (*i.e.*, bond, letter of credit) and amount to be determined by the Corps and the City to ensure successful implementation of the mitigation and monitoring plan. The project proponent shall also negotiate a long-term funding mechanism for the maintenance of the wetlands in the conservation easements in perpetuity. (LTS)

Impact BIO-2: The proposed Project could result in indirect impacts to the Suisun Marsh. (S)

The proposed Project could result in long-term indirect impacts to Suisun Marsh, resulting from project-related pollutants that could be diverted into storm drain systems that drain into the marsh. Degradation in water quality could adversely affect known populations of special-status plant and animal species occurring in Suisun Marsh.

Mitigation Measure BIO-2: The applicant shall implement mitigation measures to minimize runoff from the site as specified in Section C, Hydrology and Water Quality, of this EIR. Mitigation would include preparation of a Stormwater Pollution Prevention Plan, which would provide measures to manage runoff from the Project site. (LTS)

Impact BIO-3: The proposed Project could adversely affect 21 special-status plant species that could occur in wetlands and grassland habitats on the Project site. (S)

Based on the surveys conducted to date, 21 plant species have the potential to occur on-site. Available surveys could not determine absence due to timing of the surveys.

Mitigation Measure BIO-3: Conduct surveys during the flowering season of each species to determine if identified special status plants are present. Surveys conducted to date were inconclusive for the 21 species listed in Table IV.E-1 due to the timing of the surveys. Additional surveys are necessary to determine the presence or absence of these species on-site. If special-status plants are found on-site during subsequent surveys (likely to be conducted in the spring and summer of 2000), measures to mitigate for impacts to the plant populations would be implemented. These measures could include avoidance of the rare plant populations or collecting plants or seed from the site for transplantation in mitigation areas. Mitigation measures would be detailed in a rare plant mitigation plan subject to approval by the City and CDFG. (LTS)

Impact BIO-4: The Project could result in the removal of trees that provide nesting habitat for white-tailed kites and other raptors. (S)

The large eucalyptus trees on the Project site provide nesting habitat for large raptors. One raptor nest is present in the eucalyptus trees in the northeastern portion of the Project site.

Mitigation Measure BIO-4: Prior to construction, a qualified biologist familiar with raptors shall conduct surveys to determine the status of nesting raptors on the site. If white-tailed kites or other tree-nesting raptors are found nesting, the nest tree(s) shall be protected from disturbance during the nesting season. A temporary fence shall be placed around each active nest tree, at a minimum of 300 feet from the drip-line of the tree(s) and all construction activities shall be excluded from the fenced area. Tree protection measures shall remain in effect until a qualified biologist verifies that the adults have abandoned the nest or the young have left the nest and the nest tree. (LTS)

Impact BIO-5: The proposed Project could result in the loss of nesting and foraging habitat for burrowing owls in the Project vicinity. (S)

Burrowing owls were not observed on the Project site. However, they may colonize the site in the future. The loss of nesting and foraging habitat would constitute a significant impact.

Mitigation Measure BIO-5a: Conduct comprehensive pre-construction surveys for burrowing owl presence no more than 30 days prior to ground disturbing activity.

Mitigation Measure BIO-5b: If burrowing owls are found on the site, the project proponent will notify the City and the California Department of Fish and Game. A qualified biologist will establish an exclusion zone around each occupied burrow in which no construction-related activity will occur until the burrows are confirmed to be unoccupied. The exclusion zone will be 160 feet (50 meters) in diameter during the non-breeding season (September 1 through January 31) and 250 feet in diameter (75 meters) during the breeding season (February 1 through August 31). The project proponent (or their biological consultant) will then consult with the California Department of Fish and Game regarding implementation of avoidance or passive relocation methods. All activities will be approved by and coordinated with the California Department of Fish and Game prior to disturbance of the burrows. The project proponent will also negotiate an appropriate mitigation plan consistent with California Department of Fish and Game policies at that time. Mitigation may include permanent protection of foraging habitat around the burrow of each pair or unpaired burrowing owl; or the permanent protection of habitat at a nearby off-site location acceptable to the CDFG. (LTS)

Impact BIO-6: The proposed Project could impact three special-status bat species that may roost in the abandoned buildings on-site. (S)

The removal of abandoned buildings on the site could result in the loss of roosting habitat for western Townsend's big-eared bat, western mastiff bat and pallid bat that may roost in these buildings.

proposed
Mitigation Measure BIO-6: Prior to demolition of the buildings, a qualified biologist familiar with bats shall conduct a survey to determine the status of these and any other special-status bat species on the project site. If special-status bats are found, a biologist familiar with relocating bats shall be consulted regarding the best methods to remove *exclude* bats from the buildings. This could include removing sections of the walls and roofs, which would

discourage bats from continuing to roost in the buildings. Activities to relocate bats will be subject to approval by the California Department of Fish and Game. If a maternity colony of these species is found, the building and the bats shall not be disturbed until the young have dispersed (parturition and rearing of young typically occurs between March and September).

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No mitigation is required for common species of bats. However, if common bat species are found roosting in the buildings, similar measures could be employed to minimize harm to these bats. (LTS)

F. TRANSPORTATION AND CIRCULATION

■ ■ ■

1. Setting

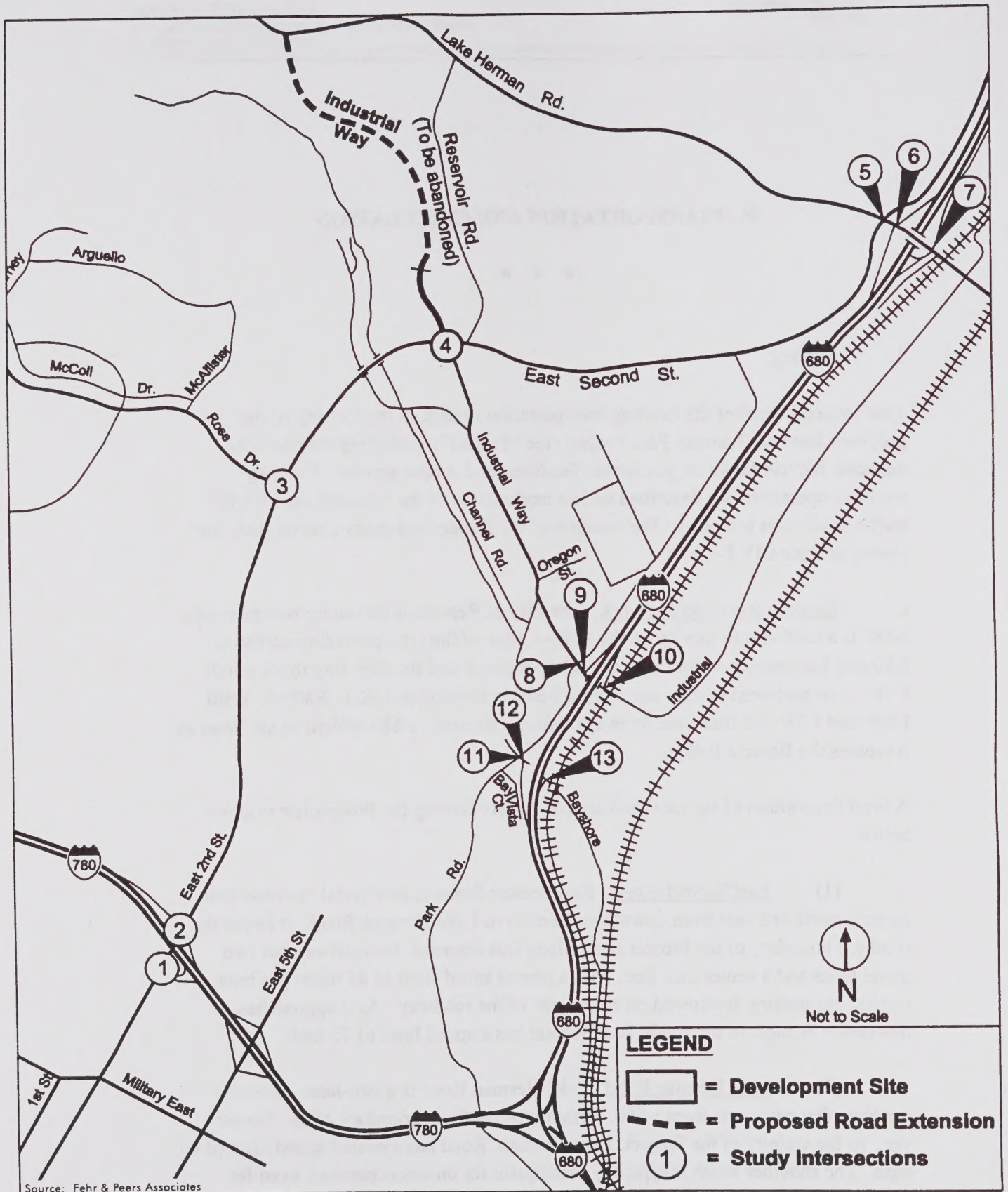
This section describes the existing transportation system in the vicinity of the proposed Benicia Business Park Project (the "Project"), including the roadway network, bicycle facilities, pedestrian facilities, and transit service. Existing roadway operations are described and an explanation of the methods used for the traffic analysis is provided. The location of the Project and study intersections are shown in Figure IV.F-1.

a. Existing Roadway Network. The City of Benicia is served by two freeways. I-680 is a north-south facility on the eastern edge of the city, providing access to I-80 and Sacramento to the north and Walnut Creek and the East Bay to the south. I-780 is an east-west facility connecting I-680 in Benicia to I-80 in Vallejo. Both I-680 and I-780 are four-lane freeways through Benicia. I-680 widens to six lanes as it crosses the Benicia Bridge.

A brief description of the local and arterial streets serving the Project site is given below:

(1) East Second Street. East Second Street is an arterial roadway that extends north and east from downtown Benicia to Lake Herman Road. It forms the southern boundary of the Project site. Along this segment, the roadway has two travel lanes and a center turn lane, with a posted speed limit of 45 miles per hour (mph). No parking is allowed on either side of the roadway. As it approaches downtown Benicia to the south, East Second has a speed limit of 35 mph.

(2) Lake Herman Road. Lake Herman Road is a two-lane, east-west roadway that runs west from I-680, forming the northern boundary of the Project site. In the vicinity of the Project, Lake Herman Road has a posted speed limit of 45 mph. The shoulder width is typically inadequate for on-street parking, even for emergency purposes.



BENICIA BUSINESS PARK

Figure IV.F-1

Regional Transportation Network

(3) Reservoir Road. Reservoir Road is a two-lane, north-south roadway that bisects the Project site and connects East Second Street to Lake Herman Road. Reservoir Road would be removed as part of the Project and replaced by an extension of Industrial Way, which will provide the same connectivity approximately ¼- to ½-mile west of Reservoir Road. Reservoir Road is a narrow roadway with no shoulders and a posted speed limit of 40 mph.

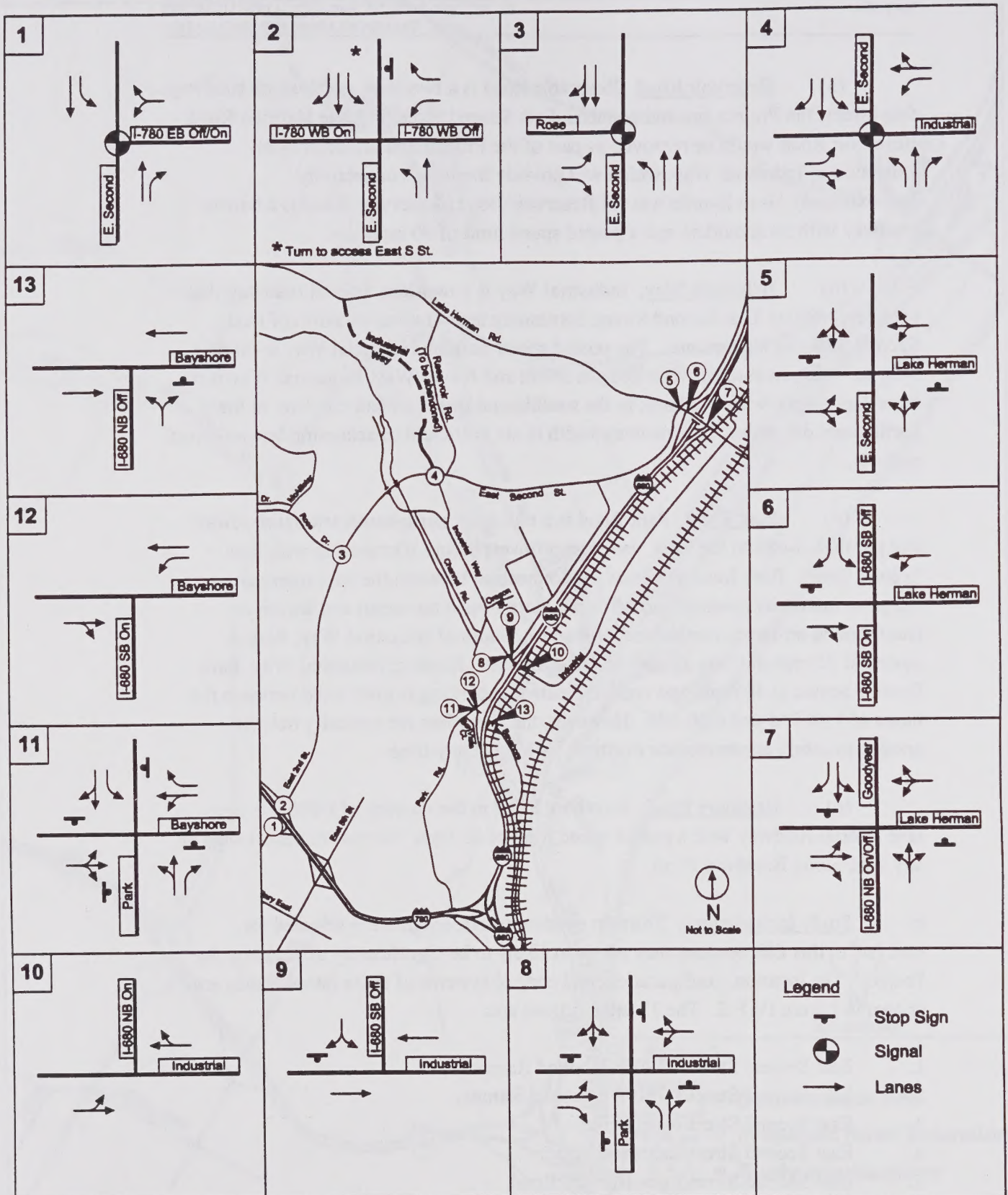
(4) Industrial Way. Industrial Way is a two-lane arterial roadway that connects I-680 to East Second Street, continuing a short distance north of East Second Street to its terminus. The posted speed limit on Industrial Way is 40 mph. Near its southern end, between Oregon Street and Noyes Way, Industrial Way is a three-lane street, with two lanes in the southbound direction and one lane in the northbound direction. The roadway width is not sufficient to accommodate on-street parking.

(5) Park Road. Park Road is a two-lane, north-south arterial roadway that parallels I-680 to the west, veering northwest before intersecting with East Second Street. Park Road serves as the connection between the split interchange ramps at Industrial (southbound off-ramp, northbound on-ramp) and Bayshore (southbound on-ramp, northbound off-ramp). South of Industrial Way, Park is posted at 35 mph and has a two-way left-turn lane. North of Industrial Way, Park Road is posted at 40 mph, and signs indicate that parking is prohibited between the hours of 7:00 PM and 6:00 AM. However, the shoulders are typically not wide enough to safely accommodate on-street parking at any time.

(6) Bayshore Road. Bayshore Road in the vicinity of I-680 is a two-lane arterial roadway with a posted speed limit of 35 mph. No parking is allowed at any time along Bayshore Road.

b. Study Intersections. Thirteen existing intersections were selected for analysis in this EIR because they are most likely to be significantly affected by the Project. The location, configuration, and control systems of these intersections are shown in Figure IV.F-2. The 13 intersections are:

1. East Second Street/I-780 Eastbound Ramps;
2. East Second Street/I-780 Westbound Ramps;
3. East Second Street/Rose Drive;
4. East Second Street/Industrial Way;
5. East Second Street/Lake Herman Road;
6. Lake Herman Road/I-680 Southbound Ramps;
7. Lake Herman Road/I-680 Northbound Ramps;
8. Park Road/Industrial Way;



Source: Fehr & Peers Associates

BENICIA BUSINESS PARK

Figure IV.F-2
Study Intersections

9. Industrial Way/I-680 Southbound Off-Ramp;
10. Industrial Way/I-680 Northbound On-Ramp;
11. Bayshore Road/Park Road;
12. Bayshore Road/I-680 Southbound On-Ramp; and
13. Bayshore Road/I-680 Northbound Off-Ramp.

c. Existing Traffic Volumes. Fehr & Peers Associates conducted morning (7:00-9:00 AM) and afternoon (4:00-6:00 PM) peak period turning movement counts at the study intersections in May, 1999. The combination of background and Project-generated traffic is expected to be highest during these periods. Figure IV.F-3 shows morning and afternoon peak hour volumes at the 13 study intersections. The morning peak hour at most study intersections begins at either 7:15 or 7:30 AM. The afternoon peak hour at intersections along the I-680 corridor is 4:00 to 5:00 PM. At intersections along East Second Street, the peak hour varies but is typically later than 4:00 to 5:00 PM.

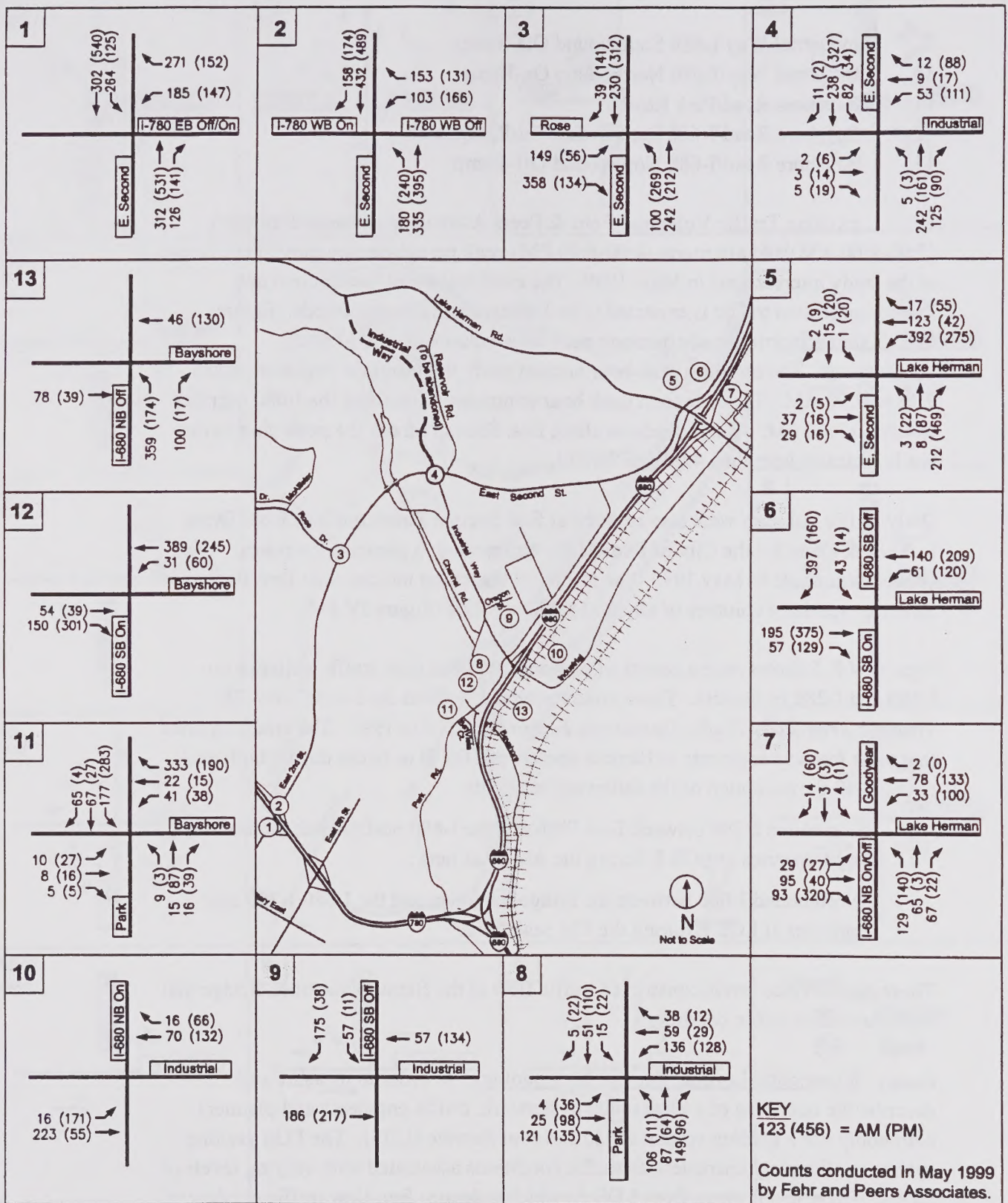
Daily traffic volumes were also counted at East Second Street south of Rose Drive by Fehr & Peers for the City of Benicia for transportation planning purposes. These counts were made in May 1999. The results of this count indicate that East Second Street serves daily volumes of almost 11,000 vehicles (Figure IV.F-4).

Figure IV.F-5 shows recent counts of AM and PM peak hour traffic volumes on I-680 and I-780 in Benicia. These volumes are taken from *the I-680/I-80/I-780 Triangle Area Study Traffic Operations Report* prepared in 1997. The study reported that most freeway segments in Benicia operate at LOS D or better during both peak hours, with the exception of the following segments:

- Eastbound I-780 between East Fifth and the I-680 northbound/southbound split operates at LOS E during the AM peak hour;
- Northbound I-680 between the bridge toll plaza and the I-680/I-780 split operates at LOS E during the PM peak hour.

These poor service levels constricted traffic flow at the Benicia-Martinez Bridge that controls nearby traffic conditions.

d. Intersection Level of Service Methodology. In order to measure and describe the operation of a local roadway network, traffic engineers and planners commonly use a grading system called Level of Service (LOS). The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of traffic. These levels range from LOS A, which indicates free-flow traffic conditions with little or no delay experienced by motorists, to LOS F, which describes congested conditions where traffic flows exceed design capacity, resulting in long

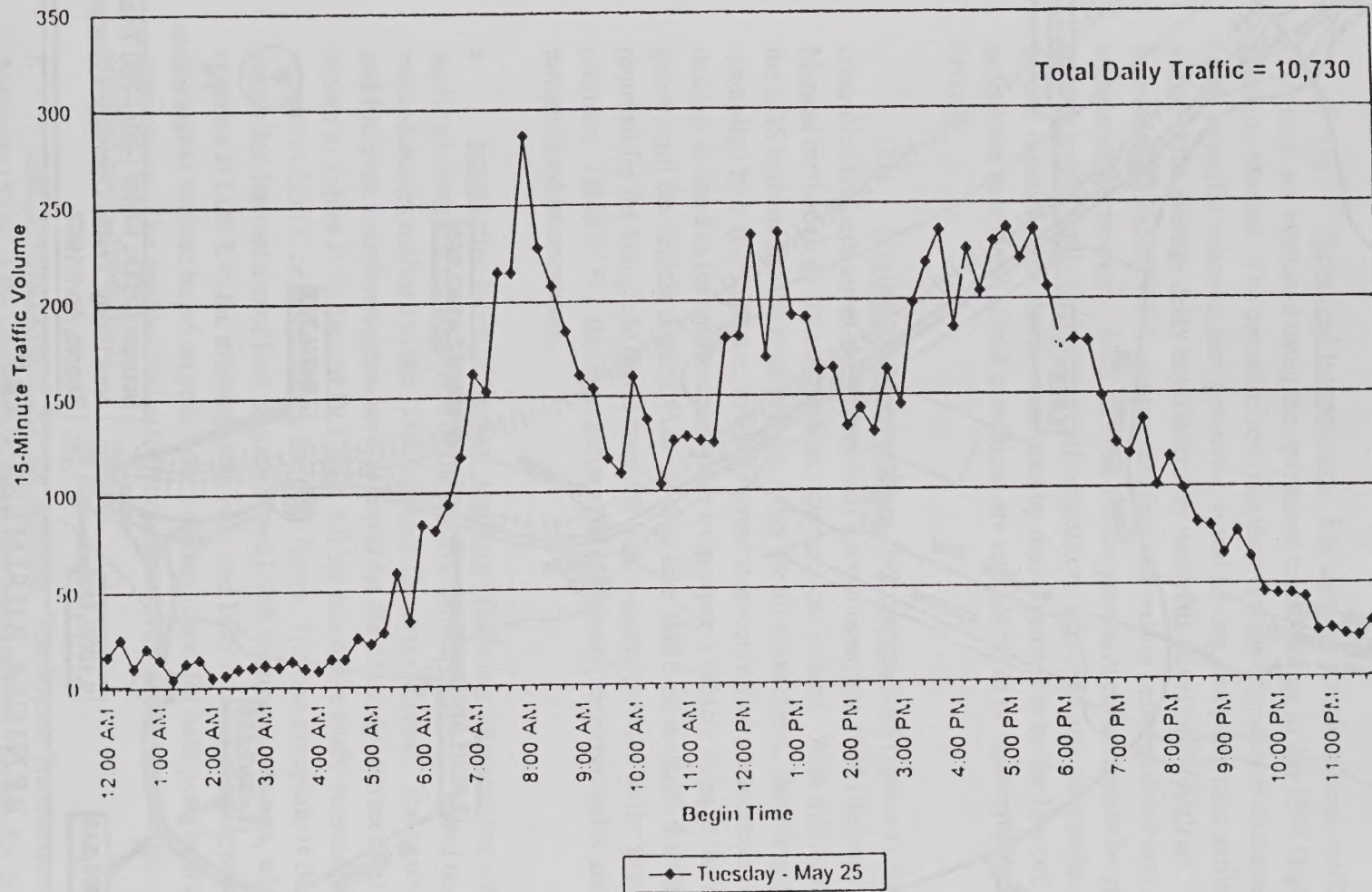


Source: Fehr & Peers Associates

BENICIA BUSINESS PARK

Figure IV.F-3
 Existing (AM/PM) Peak
 Hour Intersection Volumes

Observed Traffic Volume
East Second Street, south of Rose Drive

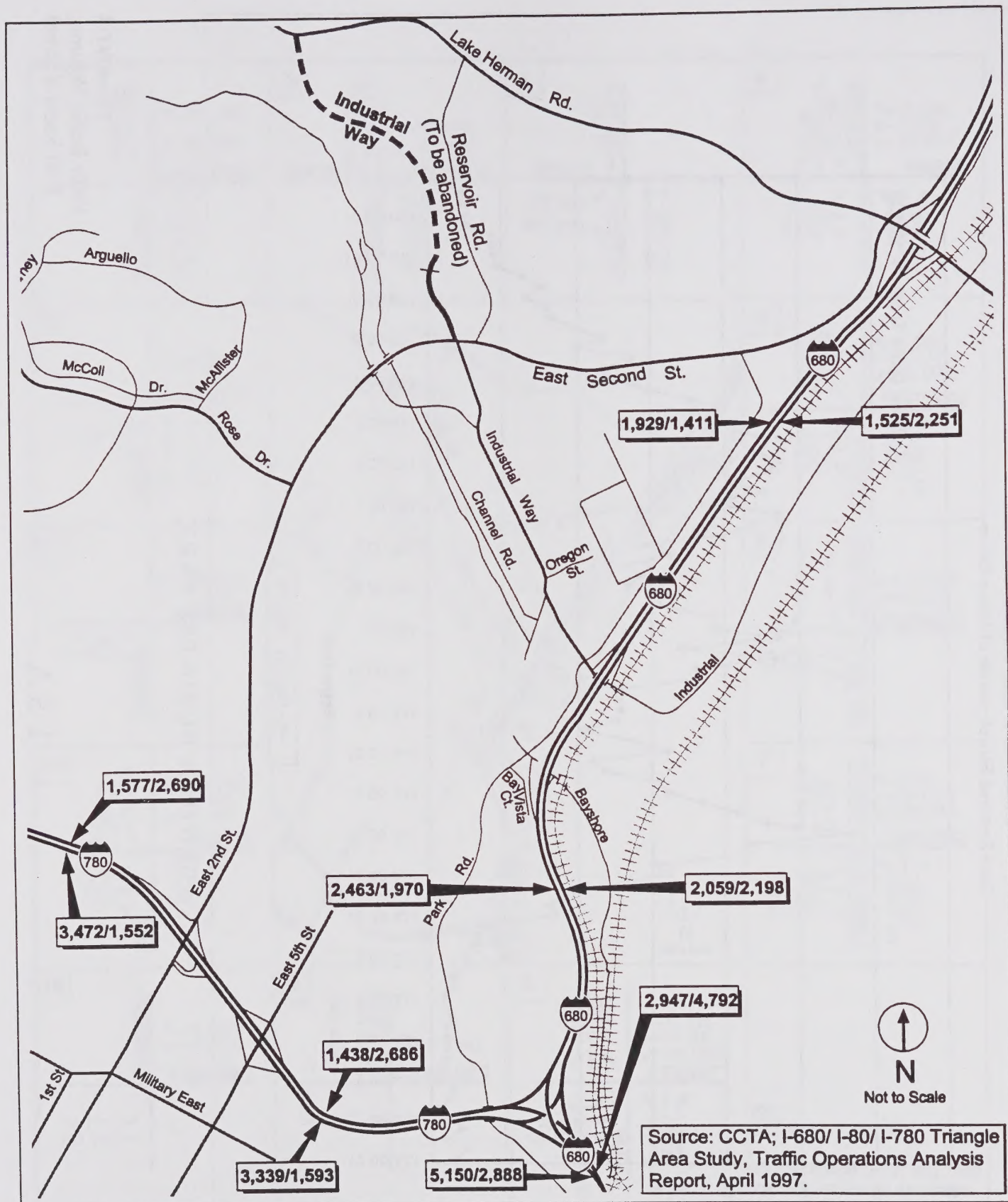


Source: Fehr & Peers Associates

BENICIA BUSINESS PARK

LSA

Figure IV.F-4
Daily Traffic Volume,
East Second Street



Source: Fehr & Peers Associates

BENICIA BUSINESS PARK

LSA

Figure IV.F-5
Existing Freeway Volumes (AM/PM)

queues and delays. This LOS grading system applies to both signalized and unsignalized intersections. Descriptions of the analysis techniques for signalized and unsignalized intersections are presented below.

(1) Signalized Intersections. For signalized intersections, traffic conditions are evaluated using the operations methodology in the 1994 Highway Capacity Manual. The operation analysis uses various intersection characteristics (such as traffic volumes, lane geometry, signal timing, and pedestrian activity) to estimate the average delay experienced by motorists traveling through an intersection. Table IV.F-1 summarizes the relationship between delay and LOS for signalized intersections. LOS A, B, and C are generally considered to be satisfactory service levels, while the influence of congestion becomes more noticeable at LOS D. LOS E is undesirable and is considered by most agencies to be the limit of acceptable delay, and LOS F conditions are considered to be unacceptable to most drivers.

(2) Unsignalized Intersections. For unsignalized (four-way stop-controlled and side street stop-controlled) intersections, the 1994 Highway Capacity Manual methodology for unsignalized intersections is used. With this methodology, the LOS is related to the total average delay for all movements, including those not controlled by a stop sign (i.e., at a side-street stop-controlled intersection). Total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. Table IV.F-1 also summarizes the relationship between delay and LOS for unsignalized intersections.

e. Intersection Level of Service Analysis. The study intersections were analyzed using the latest version of the Traffix software package, based on the methodologies outlined in the *1994 Highway Capacity Manual*. The existing AM and PM peak hour intersection service levels for the 13 study intersections are shown in Tables IV.F-2A and IV.F-2B. All but one of the study intersections operate at LOS C or better during the peak hours. The one exception is the stop-controlled intersection of East Second Street/I-780 Westbound Ramps, which operates at LOS E in the morning peak hour and LOS F in the evening peak hour. The signal warrant based on peak hour volumes is met for both peak hours at this intersection. The service level calculation sheets for all study intersections are provided in the Appendix D.

f. CMP System Level of Service Analysis. The Solano Transportation Authority (STA) is the designated Congestion Management Agency for Solano County. This agency develops the countywide Congestion Management Program (CMP) and updates it every 2 years. The CMP identifies a system of state highways

Table IV.F-1
INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Traffic Conditions	Average Delay Per Vehicle (Seconds)
Signalized Intersections		
A	Insignificant Delays: No approach phase is fully utilized and no vehicle waits longer than one red indication.	≤ 5.0
B	Minimal Delays: An occasional approach phase is fully utilized. Drivers begin to feel restricted.	5.1 to 15.0
C	Acceptable Delays: Major approach phase may become fully utilized. Most drivers feel somewhat restricted.	15.1 to 25.0
D	Tolerable Delays: Drivers may wait through more than one red indication. Queues may develop but dissipate rapidly, without excessive delays.	25.1 to 40.0
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues form upstream.	40.1 to 60.0
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 60.0
Unsignalized Intersections		
A	No delay for stop-controlled approaches.	≤ 5.0
B	Operations with minor delay.	5.1 to 10.0
C	Operations with moderate delays.	10.1 to 20.0
D	Operations with some delays.	20.1 to 30.0
E	Operations with high delays, and long queues.	30.1 to 45.0
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 45.0

Source: *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

Table IV.F-2A
EXISTING AM PEAK HOUR
INTERSECTION LEVELS OF SERVICE

Signalized Intersections	Average Delay^a	LOS
1. ^d East Second Street/I-780 Eastbound	19.7	C
3. East Second Street/Rose Drive	9.3	B
4. East Second Street/Industrial Way	9.4	B
All-Way Stop-Controlled Intersections	Average Delay^b	LOS
8. Park Road/Industrial Way	4.7	A
11. Park Road/Bayshore Road	7.5	B
Side Street Stop-Controlled Intersections	Average Delay^c	LOS
2. East Second Street/I-780 Westbound	4.1	A
5. East Second Street/Lake Herman Road	2.7	A
6. I-680 Southbound/Lake Herman Road	2.8	A
7. I-680 Northbound/Lake Herman Road	2.7	A
9. I-680 Southbound Off/Industrial Way	1.9	A
10. I-680 Northbound On/Industrial Way (no stop controlled movements)	0.1	A
12. I-680 Southbound On/Bayshore Road (no stop-controlled movements)	0.1	A
13. I-680 Northbound Off/Bayshore Road	5.0	B

^a Signalized intersection level of service based on weighted average stopped delay per vehicle, according to the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

^b All-way stop intersection level of service based on average intersection delay, according to the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

^c Intersection average delay in seconds per vehicle is shown, based on the methodology in the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

^d Numbers refer to study intersections as shown in Figure IV.F-2 and listed on page IV.F-3 of this EIR.

Source: Fehr & Peers Associates, Inc., June 1999.

**Table IV.F-2B
EXISTING PM PEAK HOUR
INTERSECTION LEVELS OF SERVICE**

Signalized Intersections	Average Delay^a	LOS
1. ^d East Second Street/I-780 Eastbound	14.2	B
3. East Second Street/Rose Drive	14.6	B
4. East Second Street/Industrial Way	11.0	B
All-Way Stop-Controlled Intersections	Average Delay^b	LOS
8. Park Road/Industrial Way	5.8	B
11. Park Road/Bayshore Road	7.0	B
Side Street Stop-Controlled Intersections	Average Delay^c	LOS
2. East Second Street/I-780 Westbound	>60 ^e	F
5. East Second Street/Lake Herman Road	4.1	A
6. I-680 Southbound/Lake Herman Road	1.4	A
7. I-680 Northbound/Lake Herman Road	2.4	A
9. I-680 Southbound Off/Industrial Way	0.5	A
10. I-680 Northbound On/Industrial Way (no stop controlled movements)	1.3	A
12. I-680 Southbound On/Bayshore Road (no stop-controlled movements)	0.3	A
13. I-680 Northbound Off/Bayshore Road	2.9	A

^a Signalized intersection level of service based on weighted average stopped delay per vehicle, according to the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

^b All-way stop intersection level of service based on average intersection delay, according to the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

^c Intersection average delay in seconds per vehicle is shown, based on the methodology in the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

^d Numbers refer to study intersections as shown in Figure IV.F-2 and listed on page IV.F-3 of this EIR.

^e Delay greater than 60 seconds.

Source: Fehr & Peers Associates, Inc., June 1999.

and regionally significant principal arterials (known as the CMP system) and specifies Level of Service standards for those roadways. This system is monitored regularly by the local jurisdictions where the facilities are located, and results are included in the biennial report produced by the Solano Transportation Authority. The minimum standard throughout the Solano County system is LOS E, except at those locations where the initial LOS measurement at the inception of the program was F. The CMP facilities within Benicia, and their current operating levels, are summarized in Table IV.F-3.

g. Parking. No on-street parking is allowed along Lake Herman Road or East Second Street in the vicinity of the Project. On-street parking typically does not occur on Industrial Way, Bayshore Road, and the other local roadways, because sufficient off-street parking is provided and because shoulder widths are typically too narrow to accommodate parked vehicles.

h. Bicycle and Pedestrian Facilities. In the study area, there is a designated Class II bikeway (striped lanes and posted bikeway signs) on East Second Street south of Rose Drive. Between Rose Drive and Industrial Way, a shoulder is striped but no bikeway signs are provided. North of Industrial Way, the shoulder width is variable and continuous bike lanes are not provided. There are no other bike lanes along roadways in the vicinity of the Project site.

No pedestrian facilities, such as sidewalks or off-street paths, are provided in the Project vicinity.

i. Public Transportation. Local public transit in Benicia is provided by the City, which operates three bus routes. The Pleasant Hill BART/Vallejo route runs between those endpoints through Benicia, serving the downtown area. The Southamptton/North Hills Express route connects the north hills area to other Benicia destinations and Pleasant Hill BART. The Youth After School route circulates between Benicia schools on weekday afternoons. None of these routes currently serve the Project vicinity.

j. Regulatory Setting.

(1) Solano County. As previously noted, the Solano Transportation Authority (STA) operates as the Congestion Management Agency (CMA) for Solano County. One of the CMA's responsibilities is to analyze the impacts of local land use decisions on the regional transportation system (the CMP system). The Solano County CMA has the purview to comment on any environmental impact report prepared for proposed land use development projects, and to require that analysis of CMP system facilities be performed with the STA travel demand model. If a proposed Project is projected to cause a segment of the CMP system to deteriorate

Table IV.F-3
LOS ON CMP ROUTES IN BENICIA

Route	Location	LOS Standard	1997 LOS	Standard Violated?
I-680	Within Benicia	E	C	No
I-780	Within Benicia	E	C	No
Military Way	I-780 to East 5 th Street	E	B	No

Source: 1997 Solano Congestion Management Program.

below the adopted LOS standard, a deficiency plan must be prepared to provide mitigation for that impact. The CMA's adopted LOS standard is E for roadways and freeways in the CMP system.

(2) City of Benicia. A City's General Plan contains goals, policies and programs intended to facilitate the movement of people and goods throughout the city. The following list includes policies from the General Plan that are relevant to the proposed Project.

Policy 2.14.1: Give priority to pedestrian safety, access and transit over automobile speed and volume.

Policy 2.14.2: Discourage street widenings and the removal of on-street parking to ease traffic flow.

Policy 2.15.2: Encourage the development of pedestrian paths in hill areas as a way to link neighborhoods to schools, parks, employment centers and convenience commercial destinations.

Policy 2.20.1: Maintain at least LOS D on all city roads, street segments and intersections.

Policy 2.20.2: Seek alternatives to road widenings.

Policy 2.20.3: Maintain Lake Herman Road as a rural, two-lane, curving scenic route.

Policy 2.23.1: Provide adequate on-street and off-street parking.

Policy 2.23.2: Reduce the visibility of parking lots.

Policy 2.24.1: Continue to ensure public access to private roads in the industrial and Port areas.

The proposed project is generally compliant with these policies. The traffic standards established in these policies have been incorporated into the following thresholds of significance. The project's consistency with these thresholds would ensure consistency with the General Plan policies related to traffic and listed here. See also Table IV.A in Section A, Land Use and Policy

2. Impacts and Mitigation Measures

a. Thresholds of Significance. For the purposes of this EIR, the proposed Project would result in significant transportation impacts if it would:

- Create direct transportation or circulation impacts associated with inconsistencies with General Plan policies;
- Cause a signalized intersection to fall below LOS D, cause the need for a signal at an unsignalized intersection, or cause queuing which exceeds the lane capacity at any intersection;
- Contribute to future cumulative demand that exceeds on-site Project roadway capacity;
- Contribute 1 percent or more of the total future volume to an external roadway or freeway with inadequate capacity to meet future cumulative demand;
- Result in projected parking demand that would exceed the proposed parking supply on a regular and frequent basis;
- Result in potential conflicts for pedestrians or bicyclists, or fail to provide adequate bicycle and pedestrian access; or
- Increase transit demand above the levels provided by local transit operators or agencies.

b. Impacts and Mitigation Measures.

(1) Cumulative Conditions. This traffic analysis addresses full build-out of the proposed Project for the long-term (cumulative) case. A near-term analysis is not useful for purposes of traffic impact identification and mitigation planning of this Project, since development would occur over a 20-year period to build out. Instead of a near-term analysis, a mitigation phasing analysis is provided following the Cumulative Conditions section, to describe the timing of key impacts and corresponding mitigations, relative to a six-stage development plan.

As summarized in Table IV.F-4, the traffic analysis assumed approximately 490,000 square feet of retail uses, and 4,981,872 square feet of industrial uses. The use levels incorporate floor area ratios (FAR's) of 0.25 for retail/commercial use and 0.40 for the industrial use. These floor area ratios were developed by the applicant in consultation with City staff. The 0.40 FAR is presumed to be a conservative estimate of the ultimate average floor area ratio of the Project's industrial area, when finally built-out. While the City's allowable FAR for industrial uses in this area is 0.70, this is a limit typically applied to smaller projects on a case by case basis, and the typical built FAR is much lower than 0.70; a survey of recently approved projects showed FAR's of 0.07 to 0.51. Thus, an FAR of 0.40 for a project this large is considered to be a conservative basis for traffic generation estimates. Therefore, the amount of industrial development in Table IV.F-4 is not the same as those described in the Project description, Table III-1, which assumes an FAR of 0.33 for industrial uses (refer to Chapter III, Project Description).

The retail uses are located in the eastern portion of the Project site, and would be developed during phases 1 through 4; the industrial uses are located in the central and western portions of the site, and would be developed during phases 3 through 12.

As shown on the Project site plan (refer to Figure III-2 in Chapter III, Project Description), the Project's primary circulation system consists of an east-west roadway connecting Lake Herman Road to Industrial Way (referred to as Boulevard 'A'), and an extension of Park Road which runs north to connect to Boulevard A. Industrial Way extends north to connect to Lake Herman Road, and Reservoir Road is abandoned as part of the development.

(2) Analysis Methodology. The Solano County travel demand model, which is maintained by the Solano Transportation Authority, was used as a tool to forecast future traffic conditions in Benicia. A model run was performed for the year 2010, capturing the traffic growth expected in Benicia due to land use changes, shifts in travel behavior, planned transportation improvements and other considerations. Some of the highway improvements included in the 2010 model network are significant for the purposes of this analysis. These include a second Benicia-Martinez bridge span, resulting in five lanes of traffic capacity in each direction, and the expansion of Park Road between Bayshore Road and Industrial Way from two to four lanes. These improvements are assumed to be in place in the STA 2010 model.

The model was used to develop background growth in traffic volumes to the year 2010 (the Future – No Project condition). Traffic from one additional background

**Table IV.F-4
PROJECT LAND USE**

Phase	Retail Development^a (Square Feet)	Industrial Development (Square Feet)
1	108,900	
2	149,190	
3	129,590	81,024
4	102,320	109,072
5		456,680
6		394,480
7		590,328
8		703,928
9		639,984
10		473,064
11		748,360
12		784,952
Total	490,000	4,981,872

^a Total developed area was calculated using floor area estimates of 0.25 for retail uses and 0.40 for industrial uses.

Source: City of Benicia Planning Department and LSA Associates, 2000.

project, the nearby Tourtelot property residential project, was added manually to the model projections. The background traffic volumes are described in Section 3, below.

For the Future – With Project condition, the Project traffic volumes were manually added to the No Project volumes using a trip generation and distribution process described in Section 4, below.

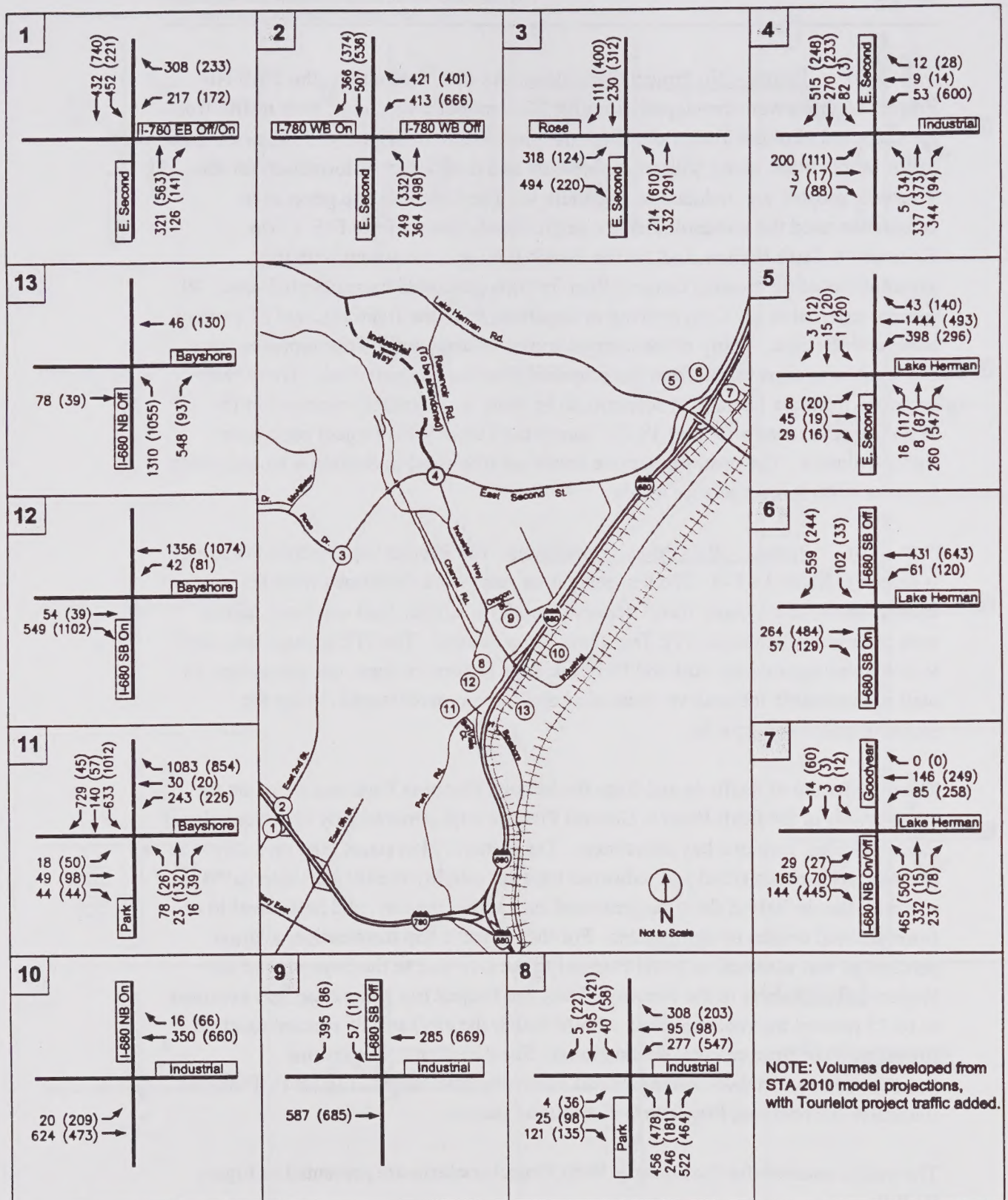
For both future cases (No Project and With Project), the future intersection lane configuration and control type at most locations were assumed to match the ultimate configuration/control type shown in the City of Benicia General Plan (see Figure IV.F-6). However, at three intersections, the General Plan lane configurations exceeded the capacity needed by the future volumes predicted in this study, and at a fourth location additional capacity needs were identified. For these locations, different lane configurations were assumed for the initial (pre-mitigation) LOS analysis. These details are fully described in Section 4, below.

(3) Future – No Project Conditions. As described above, the 2010 No Project volumes were developed from the 2010 model projections, with traffic from the proposed 426-unit Tourtelot residential project added manually. Reduced copies of the model plots, along with trip generation and distribution information for the Tourtelot project, are included in Appendix D. The Tourtelot trip generation calculation used the standard rates for single-family homes from ITE's *Trip Generation, Sixth Edition*, and the trip distribution was consistent with the assumptions of the Benicia General Plan for trips generated by residential uses: 49 percent external to the City, arriving or departing from the freeways, and 51 percent internal to Benicia. Many of the internal trips produced in the Tourtelot area were expected to be trips to and from the proposed Benicia Business Park. These were excluded from the No Project scenario, to be more appropriately captured in the With Project scenario. Figure IV.F-7 shows the Future – No Project peak hour traffic volumes. The resulting service levels are discussed in Section 4 below, along with the With Project service levels.

(4) Future – With Project Conditions. The Project trip generation estimate is shown in Table IV.F-5. The trip generation rates were developed from the rates used in the Solano County travel demand model for similar land use types, along with rates published in the ITE *Trip Generation* manual. The ITE manual was used to determine appropriate AM and PM peak hour factors for these use categories, as well as reasonable inbound vs. outbound distribution percentages during the morning and evening peaks.

The distribution of traffic to and from the Benicia Business Park was based on the assumptions in the Draft Benicia General Plan for trips generated by commercial and industrial uses, with one key adjustment. The General Plan states that, on a citywide average basis, commercial and industrial trips are roughly evenly split internal/external; that is, half of the trips generated stay within the city, and half travel to or from external origins or destinations. For the Project's trip distribution, a larger percentage was assumed to travel external to the city, due to the large size of the Project and proximity to the freeway. Thus, the Project trip generation was assumed to be 25 percent internal (traveling wholly within the city) and 75 percent external (traveling to or from external destinations). The directional proportions (north/south/west) shown in the General Plan were maintained. Figure IV.F-8 illustrates the resulting Project trip distribution pattern.

The traffic volumes for the Future – With Project scenario are presented in Figure IV.F-9.



Source: Fehr & Peers Associates

BENICIA BUSINESS PARK

Figure IV.F-7
Intersection Peak Hour Volumes
(AM/PM), Future - No Project

**Table IV.F-5
PROJECT TRIP GENERATION**

Phase	Development Amount (sq ft)	Development Type	Percent Developed (sq ft)	Daily Trip Gen Rate (per 1000sf)	Daily Trip Gen	Percent Developed (TG)	AM Peak Hour Factor	AM Peak Trip Gen	PM Peak Hour Factor	PM Peak Trip Gen
1	108,900	Medium Retail	2.0%	40	4,356	9.8%	4%	174	8%	348
2	120,335	Medium Retail	4.2%	40	4,813	20.6%	4%	193	8%	385
2	28,855	Low Retail	4.7%	40	1,154	23.2%	2%	23	9%	104
3	129,590	Low Retail	7.1%	40	5,184	34.8%	2%	104	9%	467
3	81,024	Industrial	8.6%	5	405	35.8%	11%	45	12%	65
4	102,320	Low Retail	10.4%	40	4,093	44.9%	2%	82	9%	274
4	109,072	Industrial	12.4%	5	545	46.2%	11%	60	12%	65
5	456,680	Industrial	20.8%	5	2,283	51.3%	11%	251	12%	274
6	394,480	Industrial	28.0%	5	1,972	55.7%	11%	217	12%	237
7	590,328	Industrial	38.8%	5	2,952	62.4%	11%	325	12%	354
8	703,928	Industrial	51.6%	5	3,520	70.3%	11%	387	12%	422
9	639,984	Industrial	63.3%	5	3,200	77.5%	11%	352	12%	384
10	473,064	Industrial	72.0%	5	2,365	82.8%	11%	260	12%	284
11	748,360	Industrial	85.7%	5	3,742	91.2%	11%	412	12%	449
12	784,952	Industrial	100.0%	5	3,925	100.0%	11%	432	12%	471
Total	5,471,872				44,509			3,315		4,661

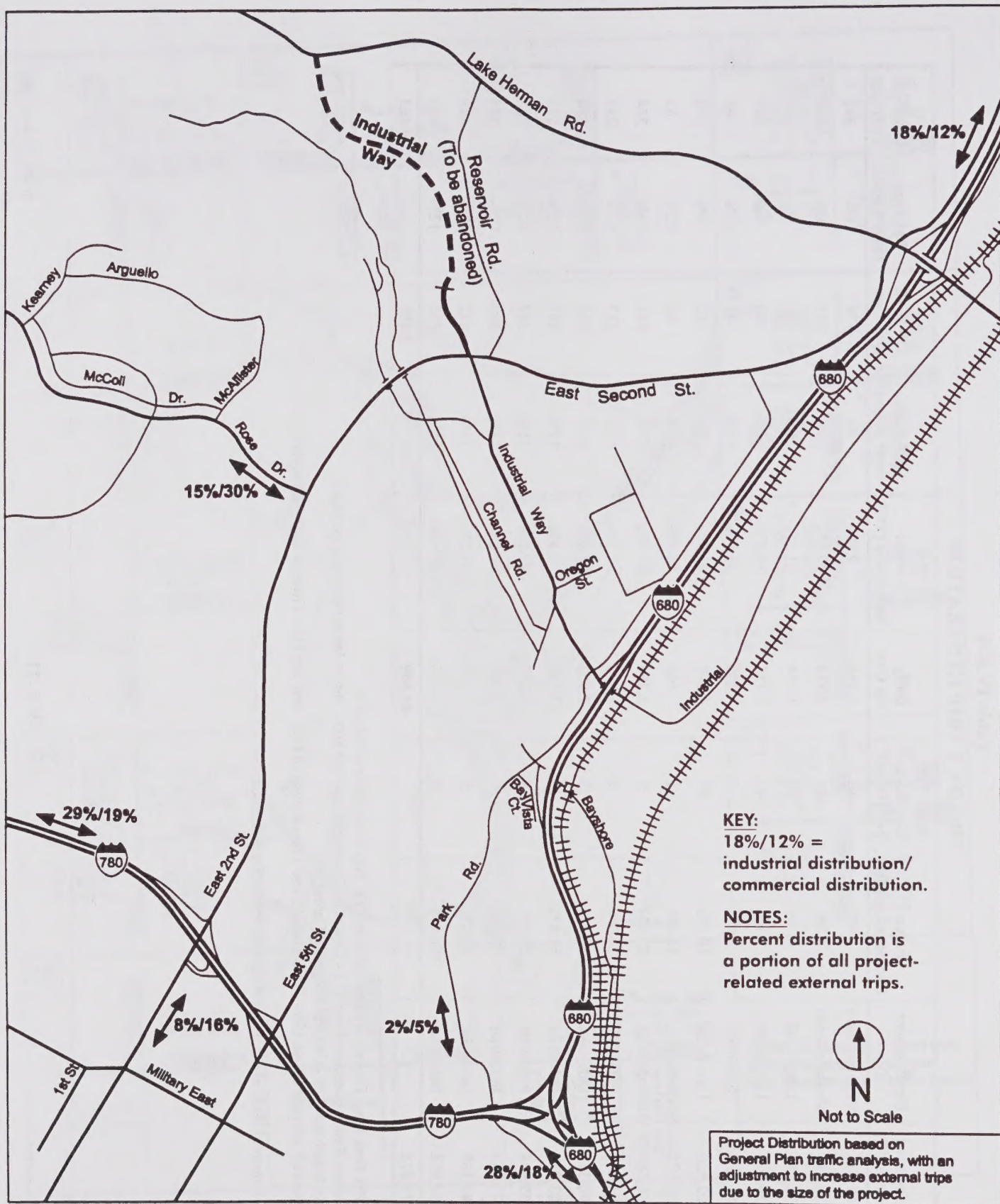
Notes: AM and PM Peak Hour Factors determined from ITE Trip Generation as follows:

Medium Retail: average of use 813 - Discount Superstore, and use 862 - Home Improvement Superstore

Low Retail: use 820 - General Shopping Center

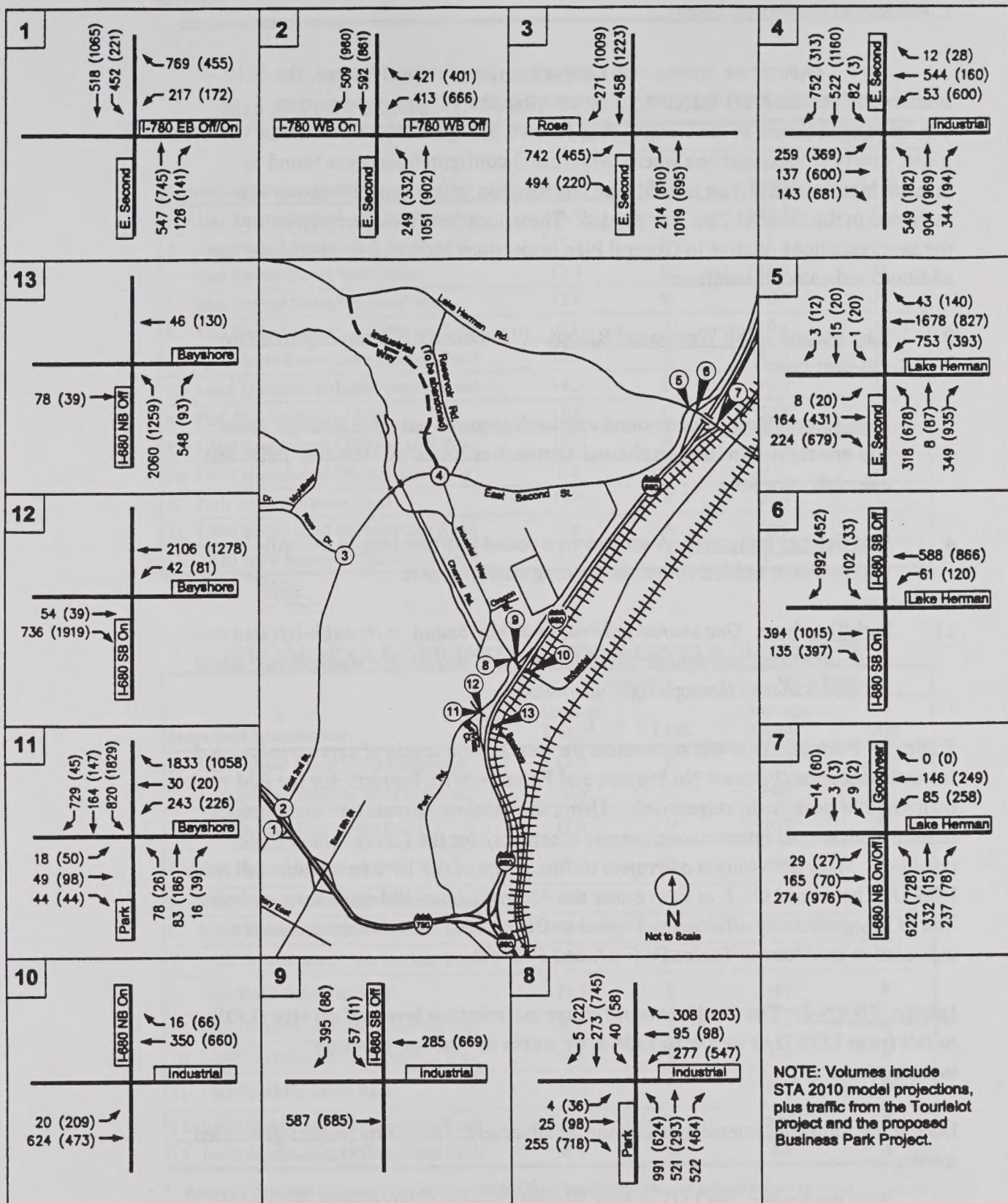
Industrial: average of use 150 - Warehousing, use 130 - Industrial Park, and use 110 - General Light Industrial

Assumes Industrial FAR of 0.4, per instructions from City of Benicia.



BENICIA BUSINESS PARK

Figure IV.F-8
Project Trip Distribution
(Industrial/Commercial)



Source: Fehr & Peers Associates

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Figure IV.F-9
Intersection Peak Hour Volumes
(AM/PM), Future - With Project

(a) *Impacts on Intersection Operation.* As previously noted, the 2010 intersection service level calculations assume that the ultimate intersection configurations shown in the General Plan (shown in Figure IV.F-6) would be in place, except at two locations where the ultimate configurations were found to provide more capacity than needed, and one location where capacity above that indicated in the General Plan was needed. These locations are described below, with the lane reductions relative to General Plan projections indicated in italics and lane additions indicated in boldface:

2. East Second/I-780 Westbound Ramps. Westbound off-ramp required **two** left-turn lanes.
3. East Second/Rose. Southbound approach requires only *two through lanes* and one right-turn lane; eastbound approach requires two left-turn lanes and *one right-turn lane*.
4. East Second/Industrial. A second westbound left-turn lane is the only improvement needed above the existing configuration.
11. Park/Bayshore. *One shared lane required eastbound; a through-left and two right-turn lanes westbound; two lefts, through and a right southbound; and a left and a shared through-right northbound.*

Tables IV.F-6A and IV.F-6B summarize the intersection levels of service calculated for both scenarios (Future – No Project; and Future – With Project), for the AM peak hour and PM peak hour, respectively. Using the baseline intersection assumptions described above, all intersections operate acceptably for the Future – No Project condition. With the addition of Project traffic, seven of the 13 intersections fall from LOS D or better to LOS E or F, in either the AM peak hour, PM peak hour, or both. The LOS significantly affected by Project traffic at these seven intersections are indicated in boldface on Tables IV.F-6A and IV.F-6B.

Impact TRAN-1: The Project would cause intersection levels of service (LOS) to fall from LOS D or better to LOS E or worse at 7 of the 13 study intersections. (S)

LOS at the following intersections would be adversely affected by project-generated traffic:

- With the Project, the LOS at East Second Street at I-780 Eastbound during the AM peak would be reduced from LOS C to LOS E.
- The LOS at East Second Street at I-780 Westbound during the PM peak would deteriorate from LOS C to LOS F with the Project.

Table IV.F-6A
2010 AM PEAK HOUR INTERSECTION LEVELS OF SERVICE^a

Signalized Intersections	No Project		With Project	
	Average Delay ^b	LOS	Average Delay ^b	LOS
1. East Second Street/I-780 Eastbound	15.4	C	>51.9 ^c	E
2. East Second Street/I-780 Westbound	17.7	C	17.3	C
3. East Second Street/Rose Drive	13.4	B	14.9	B
4. East Second Street/Industrial Way	13.8	B	>60 ^c	F
5. East Second Street/Lake Herman Road	4.3	A	10.1	B
6. I-680 Southbound/Lake Herman Road	15.5	C	48.5	E
7. I-680 Northbound/Lake Herman Road	14.3	B	16.4	C
8. Park Road/Industrial Way	15.8	C	50.9	E
9. I-680 Southbound Off/Industrial Way	13.2	B	13.2	B
10. I-680 Northbound On/Industrial Way	1.2	A	1.2	A
11. Park Road/Bayshore Road	11.9	B	24.4	C
12. I-680 Southbound On/Bayshore Road	2.5	A	>60	F
13. I-680 Northbound Off/Bayshore Road	3.0	A	3.1	A

Table IV.F-6B
2010 PM PEAK HOUR INTERSECTION LEVELS OF SERVICE^a

Signalized Intersections	No Project		With Project	
	Average Delay ^b	LOS	Average Delay ^b	LOS
1. East Second Street/I-780 Eastbound	12.0	B	15.9	C
2. East Second Street/I-780 Westbound	18.8	C	>60 ^c	F
3. East Second Street/Rose Drive	14.2	B	16.2	C
4. East Second Street/Industrial Way	19.2	C	>60	F
5. East Second Street/Lake Herman Road	12.4	B	23.2	C
6. I-680 Southbound/Lake Herman Road	11.6	B	16.5	C
7. I-680 Northbound/Lake Herman Road	28.2	D	>60	F
8. Park Road/Industrial Way	24.0	C	>60	F
9. I-680 Southbound Off/Industrial Way	4.1	A	4.1	A
10. I-680 Northbound On/Industrial Way	6.3	B	6.3	B
11. Park Road/Bayshore Road	16.8	C	36.0	D
12. I-680 Southbound On/Bayshore Road	4.3	A	>60	F
13. I-680 Northbound Off/Bayshore Road	4.6	A	4.6	A

^a Analysis assumes General Plan recommended lane configuration and signalization (except intersections 2, 3, 11 – see text.)

^b Signalized intersection level of service based on weighted average stopped delay per vehicle, according to the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

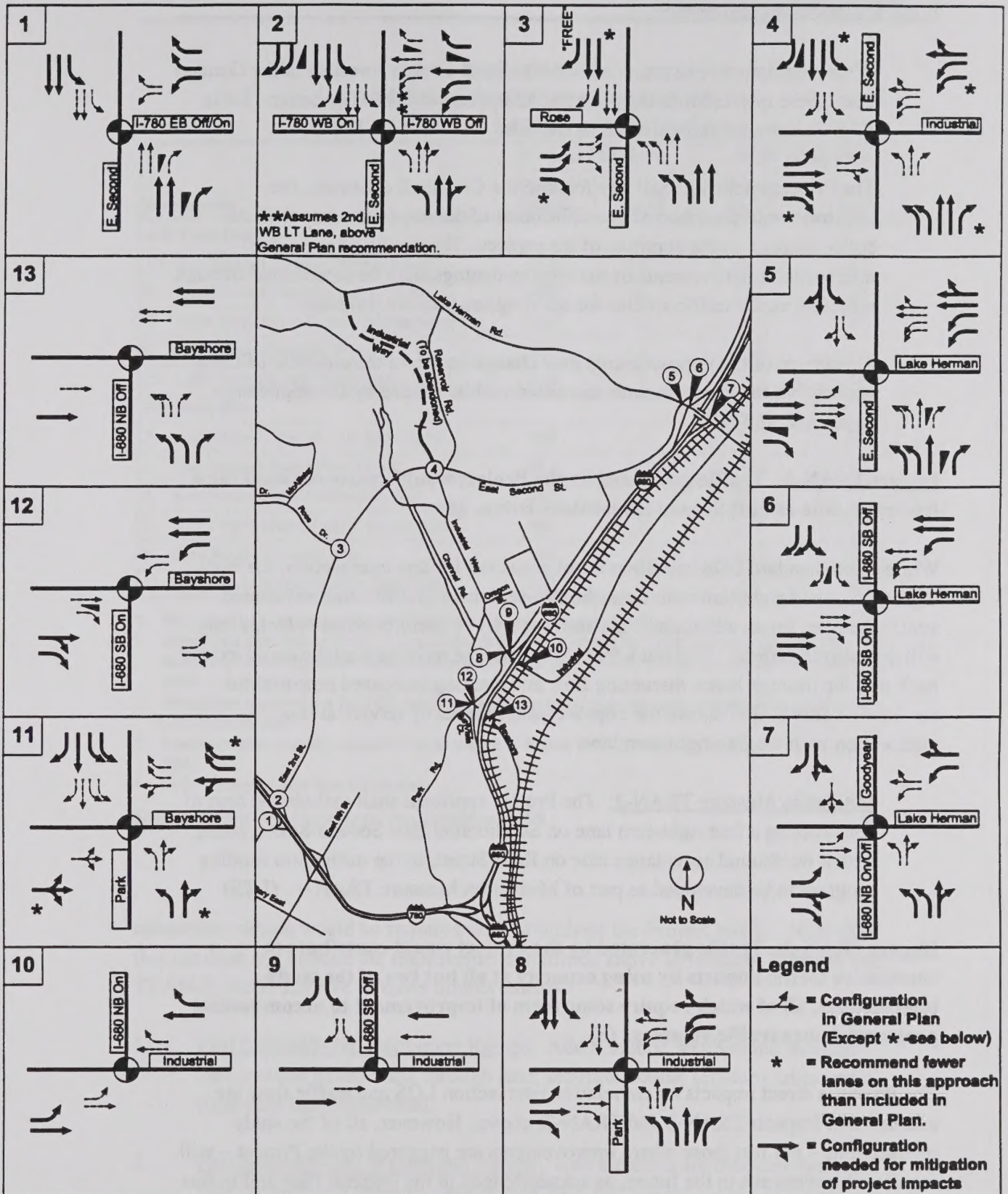
^c >60 = Delay greater than 60 seconds.

Source: Fehr & Peers Associates, Inc., April 2000.

- Both AM and PM peak LOS would be reduced at the intersection of East Second Street and Industrial Way from LOS B and LOS C to LOS F with the Project.
- Morning peak hour LOS on I-680 Southbound at Lake Herman Road would go from LOS C to LOS E with the Project.
- The LOS on I-680 Northbound at Lake Herman Road during the PM peak would deteriorate from LOS D to LOS F with the Project.
- Both AM and PM peak LOS would be reduced at the intersection of Park Road and Industrial Way from LOS C to LOS E or LOS F with the Project.
- With the Project, the LOS Southbound on I-680 at Bayshore Road during both the AM and PM peaks would be reduced from LOS A to LOS F.

Mitigation Measure TRAN-1: The following mitigation measures would bring the intersections up to LOS D or better operation with Project traffic. The mitigations are illustrated in Figure IV.F-10. Note that these mitigations represent improvements *above those identified in the General Plan (with modifications as noted above)*. The mitigations include:

- I-780 Eastbound Ramps/East Second Street. Add a second westbound right-turn lane (on the off-ramp).
- I-780 Westbound Ramps/East Second Street. Add a second southbound right-turn lane.
- East Second/Industrial. On the northbound approach, add one left-turn and one through-lane; on the eastbound approach, add one through lane and one right-turn lane; on the southbound approach, add one through lane.
- I-680 Southbound Off-Ramp/Lake Herman. Convert a southbound left-turn lane to a shared left-right lane.
- I-680 Northbound Ramps/Lake Herman. Add a southbound right-turn lane, a second northbound left-turn lane, and convert the eastbound through lane to a shared through-right (and add an acceptance lane on the on-ramp).
- Park/Industrial. Add a second northbound left-turn lane; convert the southbound right-turn lane into a shared through-right lane.
- I-680 Southbound On-Ramp/Bayshore. Add a westbound through lane; convert the eastbound through lane to a shared through-right (with an acceptance lane on the on-ramp).



Source: Fehr & Peers Associates

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Figure IV.F-10
 Intersection Lane Configurations,
 Before and After Mitigation

With these improvements, in addition to those already foreseen in the General Plan, these intersections are projected to operate at LOS D or better. Table IV.F-7 shows the mitigated service levels.

The Project applicant shall pay for, and the City shall construct, the improvements described above. The costs of the improvements shall be collected prior to the approval of the project. The timing of individual intersection improvements or roadway widenings shall be determined through project-specific traffic studies for buildings as they are proposed.

The design of the improvements may change based on the outcome of these studies, but the improvements identified will be funded by the applicant's payments. (LTS)

Impact TRAN-2: Traffic generated by the Project would create the need for a free-right lane at East Second Street/Rose Drive. (S)

While a sub-standard LOS condition is not projected for this intersection, the very high southbound right turn volume in the PM peak hour (1,100 vehicles) demonstrates the need for an additional right-turn capacity to accommodate vehicles that will queue at the signal. Without a free-right lane, the right-turn queue could extend back into the through lanes, disrupting flow and creating increased potential for conflicts. Table IV.F-7 shows the improvement in level of service at this intersection with the free right-turn lane.

Mitigation Measure TRAN-2: The Project applicant shall include the cost of constructing a free right-turn lane on Southbound East Second Street, along with a westbound acceptance lane on Rose Street, in the mitigation funding program to be developed as part of Mitigation Measure TRAN-1. (LTS)

Impact TRAN-3: Traffic generated by the Project would contribute to cumulative traffic impacts by using capacity at all but two of the study intersections, all of which require some form of improvement to accommodate projected future traffic volumes. (S)

The Project's direct impacts on cumulative intersection LOS and traffic flow are addressed in Impacts TRAN-1 and TRAN-2, above. However, all of the study intersections – not just those where improvements are triggered by the Project – will require improvements in the future, as acknowledged in the General Plan and in this study. The project traffic contributes to the need for these improvements, in the future condition. The summary below lists all intersection improvements (the numbers refer to study intersections shown in Figure IV.F-2), relative to existing

Table IV.F-7
2010 PROJECT WITH MITIGATION
INTERSECTION LEVELS OF SERVICE^a

Intersection	Without Mitigation		With Mitigation	
	Average Delay ^b	LOS	Average Delay ^c	LOS
AM Peak Hour				
1. ^d East Second Street/I-780 Eastbound	51.9	E	18.2	C
4. East Second Street/Industrial Way	>60 ^e	F	27.4	D
6. I-680 Southbound/Lake Herman Road	48.5	E	15.2	C
8. Park Road/Industrial Way	50.9	E	15.9	C
12. I-680 Southbound On/Bayshore Road	>60	F	1.1	A
PM Peak Hour				
2. East Second Street/I-780 Westbound	>60	F	20.3	C
3. East Second Street/Rose Drive ^c	16.2	C	15.6	C
4. East Second Street/Industrial Way	>60	F	29.2	C
7. I-680 Northbound/Lake Herman Road	>60	F	23.8	C
8. Park Road/Industrial Way	>60	F	34.1	D
12. I-680 Southbound On/Bayshore Road	>60	F	2.6	A

^a Mitigated LOS assumes lane configurations shown in Figure IV.F-10.

^b Signalized intersection level of service based on weighted average stopped delay per vehicle, according to the *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

^c Mitigation required not for LOS improvements, but to provide adequate storage for southbound right-turn volume.

^d Numbers refer to study intersections as shown in Figure IV.F-2 and listed on page IV.F-3 of this EIR.

^e >60 = Delay greater than 60 seconds.

Source: Fehr & Peers Associates, Inc., September 1999.

conditions, which would be required with or without the Project traffic. Note that this list does *not* include the improvements outlined above in Impacts TRAN-1 and TRAN-2, but is additive to those improvements.

1. East Second/I-780 Eastbound Ramps. Add a second southbound through lane, second northbound through lane, separate double left-turn lanes and a right-turn lane westbound.
2. East Second/I-780 Westbound Ramps. Add a second southbound through lane, northbound through-right shared lane, westbound second left-turn lane.
3. East Second/Rose. Add an exclusive southbound right-turn lane, second northbound left-turn lane, eastbound second left-turn lane.

4. East Second/Industrial. Add second westbound left-turn lane.
5. East Second/Lake Herman. Add a southbound left-turn lane, northbound double left-turn lane and single right-turn lane, eastbound left-turn, through and right-turn lanes, and westbound double left-turn lane and through lane.
6. Lake Herman/I-680 Southbound Ramps. Add a second eastbound through lane and exclusive right-turn lane, and add two westbound exclusive left-turn lanes.
7. Lake Herman/I-680 Northbound Ramps. Add a northbound left-turn lane, eastbound exclusive left-turn lane, and westbound left-turn lane.
8. Park/Industrial. Add southbound exclusive left-turn and right-turn lanes, northbound exclusive right-turn lane, eastbound exclusive left-turn lane, and westbound double left-turn lane.
9. (Project traffic does not use this intersection).
10. (Project traffic does not use this intersection).
11. Park/Bayshore. Add a southbound second left-turn lane and exclusive right-turn lane, and second westbound right-turn lane.
12. Bayshore/I-680 Southbound On-ramp. Add an eastbound exclusive right-turn lane.
13. Bayshore/I-680 Northbound Off-ramp. Add a second left-turn lane and exclusive right-turn lane northbound, and a second through lane westbound.

Since the Project traffic would use all but two of the study intersections, the Project applicant should contribute a fair share amount to assist the City in improving these intersections. The Project's volume contribution to each intersection, expressed as a percentage (Project intersection volume/total intersection volume) is included in Appendix D.

Mitigation Measure TRAN-3: The Project applicant shall contribute a fair-share amount toward the cost of making the improvements identified in Impact TRAN-3, to be determined in consultation with City staff. The fair-share costs will be collected prior to approval of the project, and will be used to fund improvements as they are needed, based on individual building project traffic impact studies (see Mitigation Measure TRAN-1). The payment of the City's traffic impact fee may be considered a fair-share

contribution, if the City's fee program can be demonstrated to effectively fund the total cost of the improvements identified above. If not, the fair share must be determined either through a new fee study or negotiation with the City. The ultimate agreement may include the requirement that the applicant fully fund certain cumulative improvements in exchange for later reimbursement as traffic impact fees are collected from other projects. (LTS)

(b) Impacts on Roadway Capacity.

Impact TRAN-4: The Project traffic would create the need for roadway widenings on various segments of East Second Street, Lake Herman Road, Bayshore Road, and Industrial Way. (S)

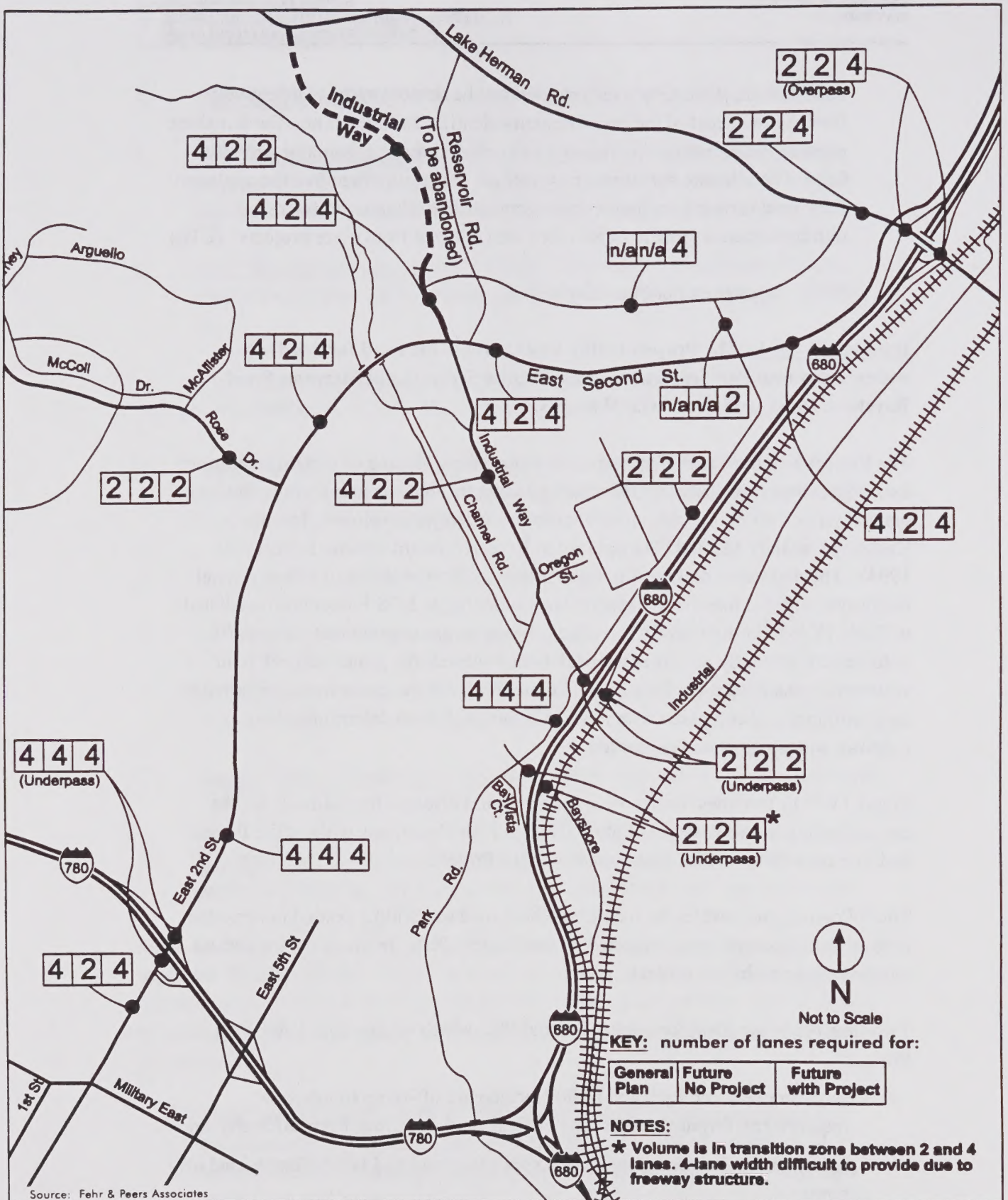
The Project generates sufficient traffic to require the widening of certain sections of existing roadways in Benicia. The roadway capacity analysis was performed using general guidelines on the capacities of arterial roadways, developed from the Highway Capacity Manual (Transportation Research Board Special Report 209, 1994). The maximum daily traffic capacities for 2-lane, 4-lane and 6-lane arterial roadways, with the maximum capacity corresponding to LOS E operation are listed in Table IV.F-8 (bottom row of the table). Using an assumption that daily traffic volumes are generally ten times the peak hour volumes, the projected peak hour volumes for the Future-No Project and Future-With Project cases were converted to daily volumes and compared with those in Table IV.F-8, to determine where roadway widenings would be needed.

Figure IV.F-11 provides results of this analysis and displays the roadway widths corresponding to two cases: 1) Future General Plan Conditions without the Project; and 2) Future General Plan Conditions with the Project.

The following summarizes the locations where roadway widths needed to serve the project would exceed those projected by the General Plan. In all cases, the greater width is triggered by the Project.

Two-lane roadways identified in the General Plan which require four lanes with Project:

- Bayshore between Park and I-680 Northbound off-ramp (borderline requirement; physical constraints make provision of four lanes difficult); and
- Lake Herman between new Project connector road and I-680 Northbound off-ramp.



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Figure IV.F-11
Number of Lanes Required
General Plan/Future No Project/
Future with Project

Table IV.F-8
LEVEL OF SERVICE CRITERIA FOR ROADWAY SEGMENTS

Maximum Daily Volume to Achieve LOS			
Level of Service	2-Lane Urban Arterial	4-Lane Urban Arterial	6-Lane Urban Arterial
A	13,700	29,800	45,400
B	15,000	31,900	48,100
C	15,600	33,000	49,700
D	16,500	34,900	52,400
E	17,400	36,700	55,200

Source: Highway Capacity Manual, TRB Special Report 209, 1994.

In addition to the above widenings, there are certain two-lane roadways which are not projected by this analysis to require widening to serve future traffic envisioned by the General Plan, unless the Project traffic is included. These segments are:

- East Second between I-780 Eastbound Ramps and Military East;
- East Second between Rose Drive and Lake Herman Road; and
- Industrial Way between East Second Street and northern terminus.

In addition, the General Plan calls for widening Industrial Way between East Second Street and I-680 to four lanes. However, the analysis shows that two lanes will be sufficient, even with the addition of Project traffic.

Mitigation Measure TRAN-4: See Mitigation Measure TRAN-3. (LTS)

Impact TRAN-5: Future traffic volumes with the Project would require roads within the Project site to be wider in some locations than proposed in the Master Plan. (S)

The Project traffic volumes indicate a need for the internal Project east-west roadway (Boulevard 'A') to be four lanes, with extra width for turn pockets or a two-way left-turn lane. In addition, Industrial Way between East Second Street and the internal east-west roadway should be sized at four lanes.

Figure IV.F-11 illustrates the capacity requirements on the Project roadways. The portion of Industrial north of Boulevard 'A', and the Park Road connection between East Second Street and Boulevard 'A', are not projected to require more than two lanes, based on the projected traffic volumes.

Mitigation Measure TRAN-5: The Project applicant shall construct four travel lanes on the east-west roadway connecting Lake Herman Road and Industrial Way, with left turn pockets or a two-way left-turn lane, and four travel lanes on Industrial Way between East Second Street and the internal east-west roadway. The roadways should be designed to City of Benicia standards, with adequate corner radii, cul-de-sac radii, and lane widths to accommodate typical industrial park vehicles such as semi-trailers. The width that is required—five 12-foot travel lanes plus paved shoulder with curb/gutter—corresponds to the City's Major Arterial designation, with a 84-foot right-of-way and 70-foot curb-to-curb width. (LTS)

(c) *Traffic Congestion Impacts – CMA Facilities.*

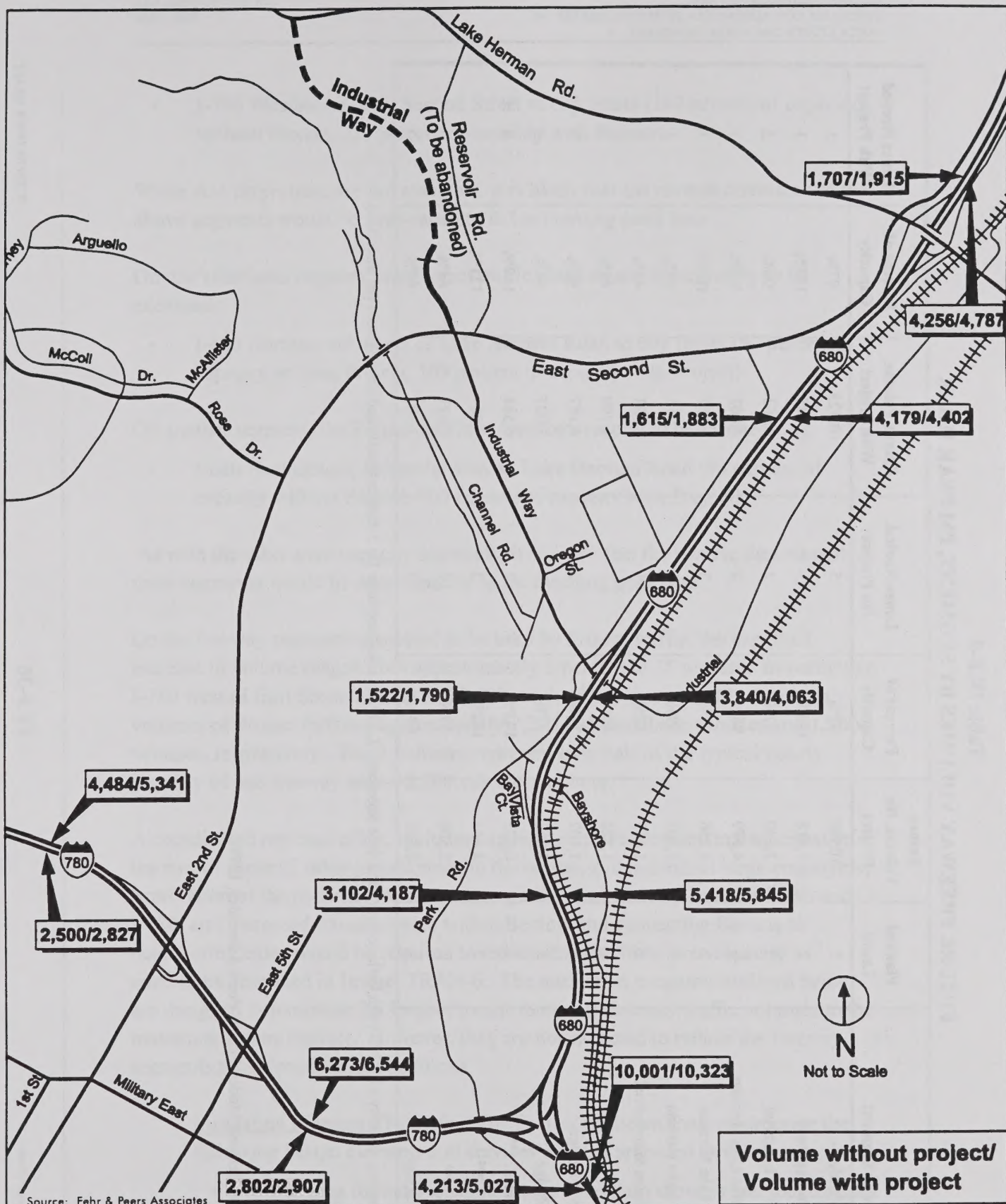
Impact TRAN-6: The Project would contribute traffic to four freeway segments which are projected to exceed the available capacity in the future. On one of the segments (I-680 Northbound north of Lake Herman Road), the Project traffic causes the over-capacity condition. (S)

Figure IV.F-12 shows the anticipated PM peak hour traffic volumes on the freeway system before and after completion of the Project. The No Project volumes are taken from the STA model run, which included planned future growth outside the Project area; the With Project volumes include the model projections plus the manually distributed Project traffic. AM peak hour volumes are not available from the model.

The typical per-lane capacities (maximum hourly volumes) for 4-lane and 6-lane freeways, as reported in the 1994 Highway Capacity Manual, are 2,200 vehicles per hour and 2,300 vehicles per hour, respectively. Currently, there are four lanes provided on I-680 and I-780 through Benicia, with no widening anticipated. At the Benicia Bridge, the planned new bridge structure will result in five lanes in each direction, in the future.

Table IV.F-9 presents a summary of the freeway lane capacities that would be required in 2010, for both the No Project and With Project scenarios. The project would contribute to cumulative traffic impacts. Three segments would operate substantially over capacity, with or without Project traffic:

- I-680 Northbound, from the north end of the bridge to Bayshore Road (123 percent of capacity without Project, 133 percent of capacity with Project);
- I-780 Westbound, from I-680 to East Second Street (143 percent of capacity without Project, 149 percent of capacity with Project); and



BENICIA BUSINESS PARK

Figure IV.F-12
 Future Freeway Volumes
 With and Without Project-
 PM Peak Hour

Table IV.F-9
FUTURE FREEWAY VOLUMES BY SEGMENT, PM PEAK HOUR

Freeway Segment	Planned Lanes	Future Volume, No Project	Percent of Capacity	Lanes Needed, No Project	Future Volume, With Project	Percent of Capacity	Lanes Needed With Project
NB ^a 680, Benicia Bridge	5	10,001	87%	5	10,323	87%	5
NB 680, Bridge to Bayshore	2	5,418	123%	3	5,845	133%	3
NB 680, Bayshore to Industrial	2	3,840	87%	2	4,063	92%	2
NB 680, Industrial to Lake Herman	2	4,179	95%	2	4,402	100%	3
NB 680, north of Lake Herman	2	4,256	97%	3	4,787	109%	3
SB ^b 680, north of Lake Herman	2	1,707	39%	1	1,915	44%	1
SB 680, Lake Herman to Industrial	2	1,615	37%	1	1,883	43%	1
SB 680, Industrial to Bayshore	2	1,522	35%	1	1,790	41%	1
SB 680, Bayshore to Bridge	2	3,102	71%	2	4,187	95%	3
SB 680, Benicia Bridge	5	4,213	37%	3	5,027	44%	3
WB^c 780, Bridge to E. 2nd	2	6,273	143%	3	6,544	149%	3
WB 780, west of E. 2nd	2	4,484	102%	3	5,341	121%	3
EB ^d 780, west of E. 2 nd	2	2,500	57%	2	2,827	64%	2
EB 780, E. 2 nd to Bridge	2	2,802	64%	2	2,907	66%	2

Note: Assumes freeway capacity of 2,200 vehicles/lane/hour for 2-lane segments, 2,300 vehicles/lane/hour for 3-lane segments and above (lanes per direction).

^a NB = northbound

^b SB = southbound

^c WB = westbound

^d EB = eastbound

Source: STA Travel Demand Model/ Fehr & Peers Associates, 1999.

- I-780 Westbound, East Second Street to city limits (102 percent of capacity without Project, 121 percent of capacity with Project).

While AM projections are not available, it is likely that the reverse directions of the above segments would be over-capacity in the morning peak hour.

On one additional segment, the Project traffic alone causes the capacity to be exceeded:

- I-680 Northbound, north of Lake Herman Road to city limits (97 percent of capacity without Project, 109 percent of capacity with Project).

On another segment, the Project traffic causes the capacity to be reached:

- I-680 Northbound, Industrial Way to Lake Herman Road (95 percent of capacity without Project, 100 percent of capacity with Project).

As with the other over-capacity segments, it is likely that the reverse direction of these segments would be over-capacity in the morning peak hour.

On the freeway segments projected to be used by Project traffic, the expected increase in volume ranges from approximately 5 percent to 35 percent. In particular, I-780 west of East Second Street and I-680 south of Bayshore would serve high volumes of Project traffic—approximately 1,200 PM peak hour vehicles and 1,500 vehicles, respectively. These volumes represent over half of the typical hourly capacity of one freeway lane—2,200 vehicles per hour.

A coordinated regional effort, including aggressive travel demand management on the part of Benicia, other jurisdictions in the region, and individual large employers; exploration of the potential for constructing additional freeway lanes on I-680 and I-780; and increased transit service within Benicia and connecting Benicia to neighboring cities would be required to reduce impacts from over-capacity conditions described in Impact TRAN-6. The mitigation measures outlined below are designed to minimize the Project's contribution to freeway traffic volumes to the maximum extent feasible. However, they are not expected to reduce the freeway segments to under-capacity conditions.

Mitigation Measure TRAN-6a: The Project applicant shall incorporate the following design elements and services into the proposed development plans:

- Incentives for individual buildings to contain showers and lockers, and secure indoor bicycle lockers;
- Mandatory bicycle racks provided near each building complex; and

- Provision of transit stops with shelters at up to four locations throughout the Park, including one at the eastern retail area, two along Boulevard 'A' in the industrial area, and one along the Industrial Way extension.

Mitigation Measure TRAN-6b: The Project applicant shall pay a fair-share of future freeway improvements, as determined by Caltrans, the Solano Transportation Authority and the Metropolitan Transportation Commission.

Mitigation Measure TRAN-6c: The Project applicant shall contribute toward the initial costs of extending the Benicia Transit Pleasant Hill BART route to the Business Park, coordinating with the City and Benicia Transit. The service should not be instituted before the Project site is at least 50 percent built and occupied. The project applicant shall pay all capital costs and all operating costs for the first 2 years of service. Implementation of this mitigation measure will be coordinated with Benicia Transit. With these mitigation measures, this impact will remain significant and unavoidable, due to the extent of the over-capacity condition projected. (SU)

(d) Parking Impacts.

Impact TRAN-7: If off-street parking is not provided at levels consistent with the City of Benicia's zoning ordinance, parking demand could exceed off-street supply, resulting in on-street parking on streets that cannot accommodate parking due to truck access and circulation needs. (S)

The Project site plans do not contain information on the amount of off-street parking to be provided for individual buildings as they are developed. Parking should be provided at levels consistent with the City's zoning ordinance, determined in consultation with City staff, at the time of individual development proposals.

On-street parking, which is generally not common in industrial areas, should not be provided on Boulevard 'A', Industrial Way north of East Second Street, or Park Road, but may be allowed on cul-de-sacs serving projects which are not anticipated to require frequent truck access. On-street parking may be desirable on internal streets serving the retail area (other than Boulevard 'A'), to enhance the pedestrian environment and be consistent with typical shopping district design standards.

Mitigation Measure TRAN-7: The Project applicant shall require that future developers of individual parcels meet the parking zoning ordinance requirements for provision of off-street parking. On-street parking should not be incorporated into the design of Boulevard 'A', Industrial Way north of East

Second Street, or Park Road north of East Second Street, but may be considered for the cul-de-sacs (if planned to serve businesses which don't require large truck access) and the internal retail area streets. (LTS)

(e) *Pedestrian Circulation.*

Impact TRAN-8: The Project site plan does not designate sidewalks on the primary traffic-serving streets, which may serve substantial pedestrian travel: Boulevard 'A', Industrial Way between East Second Street and Boulevard 'A', and Park Road north of East Second Street. (S)

The Project is planned to serve industrial uses in the central and western areas, and retail uses in the eastern area. Typically, sidewalks have not been provided in industrial areas, in Benicia and other cities, because substantial pedestrian traffic is not anticipated. In retail areas, sidewalks are typically provided to serve those using transit or on-street parking who need to walk a substantial distance to their destination.

Because this EIR recommends transit service as a way to help mitigate the traffic impacts of this Project, transit stops may be located at sites along Boulevard A, and possibly Park Road and/or Industrial Way. For this reason, it is recommended that sidewalks be provided on Boulevard 'A', Park Road north of East Second Street, and Industrial Way between East Second Street and Boulevard 'A'. These streets will serve higher traffic volumes than the individual cul-de-sacs, and as such should contain sidewalks to provide a protected facility for those walking to and from transit stops, for lunchtime recreation, to and from the retail area, etc. In the retail area, any side-streets serving large retail developments should also provide sidewalks. The industrial area cul-de-sacs can be designed with sidewalks, at the discretion of City staff and those making individual building development proposals.

Mitigation Measure TRAN-8: The Project site plan shall indicate roadway widths to accommodate sidewalks on Boulevard 'A', Industrial Way between East Second Street and Boulevard 'A', and Park Road north of East Second Street. In addition, the Project applicant shall require individual project developers to consult with City staff regarding the provision of sidewalks on the industrial area cul-de-sacs, and particularly on retail area internal streets. (LTS)

(f) *Bicycle Circulation.* The Project is not expected to serve a substantial amount of bicycle travel. While some who live in Benicia and work or shop at the Project may choose to bicycle, the topography in the vicinity of the site and distances involved make bicycling an unlikely choice for the majority of site users. The project includes construction of a 5-foot-wide bike path on each side of East

Second Street from Industrial Way to Lake Herman Road. Industrial Way would include a 10-foot-wide off-street bike path adjacent to the roadway. The roadway widths on Boulevard 'A', and Park Road north of East Second Street would provide enough room for bicyclists to ride safely on the shoulder, as there would be a 4-foot shoulder or extra-wide (16-foot) outer lane. (Refer to Mitigation Measure TRAN-5).

The Project would not result in impact to bicycle circulation. However, the City's General Plan shows an existing Class II bikeway (bikeway signs and striped lanes) along East Second Street from Seaview Drive to Lake Herman Road. Currently, there are no bikeway signs north of Rose Drive, although there are bike lanes between Rose Drive and Industrial Way. North of Industrial Way, there are no bikeway signs nor continuous bike lanes. Thus, the Class II bikeway currently extends only from Seaview to Rose.

(g) Transit Impacts.

Impact TRAN-9: The need for transit service to the Project site would require Benicia Transit to extend service beyond that currently provided. (S)

As stated in Mitigation Measure TRAN-6b, traffic congestion mitigation relies in part on the availability of transit as an alternative to driving, for commuters and shoppers traveling to and from the Project site. This mitigation measure has an impact on Benicia Transit's ability to provide services on its current routes, as it currently does not serve the Project area. Mitigation Measure TRAN-6b requires that a cost sharing agreement be developed for a route extension to the Project area, to allow the extension to be provided without the full cost being borne by Benicia Transit, initially. After the first 2 years, the use of the service and prospects for continued viability can be evaluated, and the service can be modified if needed.

Mitigation Measure TRAN-9: The Project applicant shall pay all capital costs and all operating costs for the first 2 years of Benicia Transit service to the Project site. (LTS)

c. **Mitigation Phasing.** The preceding section discussed the ultimate intersection and roadway improvements which are projected to be needed at the completion of the Project, in year 2010 or beyond. This section provides an assessment of the phasing of the roadway widenings outlined in Impact TRAN-4. The specific intersection improvements which are recommended in Impacts TRAN-1, TRAN-2 and TRAN-3 are not discussed in this phasing analysis, as they would require more detailed analysis as individual building projects are proposed and approved. However, in general the phasing of the roadway widenings provides a guideline for when particular intersections would require expansion.

The phasing analysis was performed for six two-phase "stages", with the sixth stage representing full build-out of the Project. The traffic volumes using study area roadways were estimated for each stage based on the assumptions that background (non-Project) traffic would grow at a uniform rate from 1999 to 2010. The traffic generated by each Project stage was then added manually, using the trip generation and distribution procedure described in the previous section. The resulting traffic volume estimates, and corresponding roadway lane requirements, are shown in Table IV.F-10.

The following summarizes the critical stages of Project development, as they relate to significant roadway widening requirements.

- At Stage 1 (Phases 1 + 2), all roadways function acceptably with their current widths;
- At Stage 2 (Phases 3 + 4), East Second Street between Industrial Way and Lake Herman Road would require widening to four through lanes, with left turn pockets or a two-way left-turn lane; the East Second Street underpass at I-780 would require four lanes;
- At Stage 3 (Phases 5 + 6), East Second between Military East and the current four-lane section just north of I-780 would require widening to four through lanes;
- At Stage 4 (Phases 7 + 8), no further widening is needed;
- At Stage 5 (Phases 9 + 10), two widening projects are required:
 - The Bayshore Road underpass (between Park Road and the I-680 Northbound Ramps) would require four lanes;
 - The Lake Herman Road overpass (between Boulevard 'A' and the I-680 Northbound Ramps) would require four lanes;
- At Stage 6 (Phases 11 + 12), Industrial Way from East Second Street to Boulevard 'A' would require four lanes.

The phasing analysis shows that the Project can develop through Stage 4 (Phase 8) with widening required only along East Second Street, with the most challenging portion of this widening being the I-780 underpass. This segment of East Second Street is controlled primarily by the operation of the two ramp intersections, rather than a free-flow link-based capacity. While a coordinated signal analysis was not a part of this study, it is possible that, with signal installation at the westbound ramps and optimized phasing, the projected Stage 2 widening could be delayed to a later stage. However, periods of failing operation during the peak hours, with long vehicle queues, might occur even with optimized intersection capacity and signal timing.

Table IV.F-10
PHASING OF ROADWAY WIDENINGS

Stage ^a	Cumulative Development		Estimated Daily Volumes and Roadway Widths Required							
	Retail	Industrial	E. 2 nd , Military to 780	E. 2 nd , 780 to Rose	E. 2 nd , Rose to Industrial	E. 2 nd , Industrial to Lake Herman	Industrial, E. 2 nd to Boulevard 'A'	Bayshore Underpass	Lake Herman Overpass	East 2 nd Underpass
1	258,090	0	15,300 2 (C)	15,300 2 (C)	12,400 2 (A)	12,500 2 (A)	3,200 2 (A)	7,000 2 (A)	9,800 2 (A)	16,000 2 (D)
2	490,000	190,096	17,200 2 (E)	19,100 4 (A)	19,200 4 (A)	18,200 4 (A)	4,200 2 (A)	9,500 2 (A)	12,500 2 (A)	19,300 4 (A)
3	490,000	1,041,256	18,000 4 (A)	21,600 4 (A)	22,700 4 (A)	20,200 4 (A)	7,400 2 (A)	12,900 2 (A)	14,300 2 (B)	21,100 4 (A)
4	490,000	2,335,512	19,100 4 (A)	24,700 4 (A)	27,300 4 (A)	22,800 4 (A)	12,000 2 (A)	17,100 2 (E)	16,500 2 (D)	23,200 4 (A)
5	490,000	3,448,560	20,100 4 (A)	27,600 4 (A)	31,500 4 (B)	25,300 4 (A)	16,000 2 (D)	21,000 4 (A)	18,600 4 (A)	25,300 4 (A)
6	490,000	4,981,872	21,200 4 (A)	31,200 4 (B)	36,600 4 (E)	28,400 4 (A)	23,800 4 (A)	22,000 4 (A)	21,100 4 (A)	27,600 4 (A)

^a Each "stage" represents a combination of two phases; for example, Stage 1 = Phase 1 + Phase 2, Stage 2 = Phase 3 + Phase 4, etc. Phases are linked to development of specific lots which are discussed in Chapter III of this EIR and listed in Table III-1.

Source: Fehr & Peers Associates, 2000.

Beyond Stage 4, which corresponds to 50 percent build-out of the full Project (full build-out of the retail portion and 47 percent build-out of the industrial portion), two difficult widening projects are anticipated: (1) the Lake Herman overpass (four lanes); and (2) the Bayshore underpass (four lanes). Both of these widening projects would present design and construction challenges and would be expensive to construct due to the structural re-design that would be required.

An analysis of the intensity of development that could occur at the site without requiring major overpass and underpass modifications was conducted. The amount of development represented by Stages 1 through 4 would be consistent with full build-out of the Project, if a floor area ratio of 0.23 were assumed instead of 0.50, for the industrial portion of the Project. If the Project FAR were 0.23, then the full Project could be completed prior to the need to widen the Lake Herman overpass and Bayshore underpass.

Beyond the Stage 5 improvements (i.e., the Lake Herman overpass and Bayshore underpass), the Stage 6 development would require the widening of Industrial Way between East Second Street and Boulevard 'A'.

As previously noted, the specific intersection turn-lane improvements noted in the evaluation of future traffic conditions with the Project are not described in this phasing analysis, because they would need to be fine-tuned as the Project builds out. However, in general, the intersection improvements would be required at approximately the same stage as the widenings projected for the adjacent roadways.

G. AIR QUALITY

■ ■ ■

This section describes the baseline air quality and meteorological conditions at the Project site, identifies short-term and long-term impacts, and recommends appropriate mitigation measures. Also provided is a discussion about the regulatory framework from which the impact analysis is derived.

1. Setting

Both the State and federal governments have established health-based Ambient Air Quality Standards (AAQS) for six air pollutants: carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, lead, and suspended particulate matter. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

In addition to primary and secondary AAQS, the State of California has established a set of episode criteria for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three.

California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) are listed in Table IV.G-1. Health effects of these criteria pollutants are listed in Table IV.G-2.

a. Meteorology/Climate. Meteorology is often an important mediator of air pollutant impact severity. Atmospheric stability, wind speed, wind direction, and the influence of local terrain control the speed with which pollutants disperse as one moves away from a pollutant release point to a receptor.

**Table IV.G-1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone	1-hour	0.12 ppm	0.09 ppm
Carbon Monoxide (CO)	1-hour	35 ppm	20 ppm
	8-hour	9 ppm	9.0 ppm
Nitrogen Dioxide (NO ₂)	1-hour annual	---	0.25 ppm
	Annual average	0.053 ppm	---
Sulphur Dioxide (SO ₂)	1-hour	---	0.25 ppm
	24-hour	0.14 ppm	0.04 ppm
	Annual average	0.03 ppm	---
Suspended Particulates (PM ₁₀)	24-hour annual	150 ug/m ³	50 ug/m ³
Lead (Pb)	30-day average	---	1.5 ug/m ³
	Calendar quarter	1.5 ug/m ³	---

ppm: parts per million

ug/m³: micrograms per cubic meter.

Source: California Air Resources Board.

**Table IV.G-2
HEALTH EFFECTS SUMMARY FOR THE
MAJOR CRITERIA AIR POLLUTANTS**

Air Pollutant	Adverse Effects
Ozone	• eye irritation • respiratory function impairment
Carbon Monoxide (CO)	• impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin • aggravation of cardiovascular disease • impairment of central nervous system function • fatigue, headache, confusion, dizziness • can be fatal in the case of very high concentrations in enclosed places
Sulfur Dioxide (SO ₂)	• aggravation of chronic obstructive lung disease • increased risk of acute and chronic respiratory illness
Nitrogen Dioxide (NO ₂)	• risk of acute and chronic respiratory disease
Suspended Particulates (PM ₁₀)	• increased risk of chronic respiratory disease with long exposure • altered lung function in children • with SO₂, may produce acute illness • particulate matter 10 microns or less in size (PM₁₀) may lodge in and/or irritate the lungs
Lead (Pb)	• impairment of learning and mental functions • acute toxicity with prolonged exposure

Source: Bay Area Air Quality Management District.

Regional flow patterns have an effect on air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions such as light winds and shallow vertical mixing, and topographical features such as surrounding mountain ranges, create areas of high pollutant concentrations by hindering dispersal. When a warm layer of air traps cooler air close to the ground, an inversion layer is produced. Such temperature inversions especially hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

During summer's longer daylight hours, plentiful sunshine provides the energy needed to fuel photochemical reactions between nitrogen oxides (NO_x) and reactive organic gases (ROG) which result in ozone (O_3) formation. To reach high levels of O_3 adequate sunshine, early morning stagnation in source areas, high surface temperatures, strong and low morning inversions, greatly restricted vertical mixing during the day, and daytime subsidence that strengthens the inversion layer are required. High O_3 patterns are primarily a function of pollutant transfer patterns due to the long formation time associated with O_3 .

b. Regional Air Quality. The Project area is in the City of Benicia on the north side of Carquinez Strait, which is located in the San Francisco Bay Area, a large, shallow air basin ringed by hills which taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist. One is through the strait known as the Golden Gate, which is a direct outlet to the ocean. The second extends to the northeast, along the west delta region of the Sacramento and San Joaquin Rivers.

The City of Benicia is within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which regulates air quality in the San Francisco Bay Area. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically. Public health benefits, improved visibility, and reduced damage to plants and materials are among the benefits of cleaner air. Continued progress in improving the air quality in the Bay Area is necessary.

BAAQMD's Bay Area Clean Air Plans (CAPs) contain districtwide control measures to reduce carbon monoxide and ozone precursor emissions. The State standards for these pollutants are more stringent than the national standards.

Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons. As is true throughout much of the U.S., motor vehicle use is projected to increase substantially in the region. The BAAQMD, local

jurisdictions, and other parties responsible for protecting public health and welfare will need to continue to minimize the air quality impacts of growth and development.

c. Attainment Status Designation. ARB is required to designate areas of the state as attainment, nonattainment, or unclassified for any state standard. An "Attainment" designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A "Nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "Unclassified" designation signifies that data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for ozone (O₃), carbon monoxide (CO), and nitrogen dioxide (NO₂) as either "Does not meet the primary standards," or "Cannot be classified," or "Better than national standards." For SO₂, areas are designated as "Does not meet the primary standards," "Does not meet the secondary standards," "Cannot be classified," or "Better than national standards." In 1991, new nonattainment designations were assigned to areas that had previously been classified as Group I, II, or III for Particulate Matter (PM₁₀) based on the likelihood that they would violate national PM₁₀ standards. All other areas are designated "Unclassified."

In June 1995, the region was redesignated as an attainment area for the national ozone standard, making the Bay Area the largest metropolitan region in the United States to have achieved that distinction. However, unusual heat waves triggered new exceedances of the national ozone standard in the summers of 1995 and 1996, which led the EPA to change the Bay Area's ozone status back to nonattainment in July 1998. Ozone level also exceeded twice the State standard in 1996.

No exceedance of the State or national CO standard have been recorded at any of the region's monitoring stations since 1991. The Bay Area has attained the State CO standard. In early 1998 the Bay Area was redesignated by the EPA as an attainment/maintenance area for the federal CO standards.

Levels of suspended matter (PM₁₀) in the Bay Area currently exceed California Clean Air Act standard, and therefore the area is considered a nonattainment area for this pollutant. The Bay Area is currently unclassifiable (equivalent to an attainment designation) for the federal PM₁₀ standard. The Bay Area is designated as a

nonattainment area for the State ozone and PM_{10} standards, and as an attainment area for the State carbon monoxide standard.

In July 1997, the EPA revised the violation criteria for the existing federal PM_{10} standards, adopted a new 8-hour ozone standard (an 8-hour average of 0.08 ppm), and adopted new fine particle ($PM_{2.5}$) standards (15 micrograms per cubic meter as an annual average and 65 micrograms per cubic meter as a 24-hour average). These standards became effective in September 1997, but nonattainment designations related to the new ozone standard will not be made for at least three years. The federal 1-hour ozone standard will be rescinded for an area only after EPA determines that it has been achieved in that area. The new $PM_{2.5}$ standard was struck down by a court ruling in April 1999. In addition, monitoring networks for the new $PM_{2.5}$ standards are not yet fully in place, therefore any nonattainment designations for $PM_{2.5}$ will not be made for at least a few years.

Table IV.G-3 provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

d. Local Air Quality. Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment.

The City of Benicia lies on the north side of the Carquinez Strait. The Carquinez Strait is the only sea-level gap in the central and northern California coastal mountains, which results in relatively strong and persistent winds. Winds are generally greatest during spring and summer and lowest in fall and winter. A strong daily variation in wind occurs in spring and summer, with peak winds occurring in the late afternoon hours and winds gradually decreasing at night. During fall and winter winds are generally more variable both in speed and direction as the area is influenced by storms from the Pacific Ocean.

The occurrence of episodes of high atmospheric stability, known as inversion conditions, severely limits the ability of the atmosphere to disperse pollutants vertically. Inversions can be found during all seasons in the Bay Area, but are particularly prevalent in the summer months when they are present about 90 percent of the time in both morning and afternoon.

Topography also affects air quality. Benicia is located between the expansive Sacramento and San Joaquin Valleys to the east and the San Francisco Bay to the west, and the large summertime temperature differences between these two areas result in a strong flow of generally westerly winds that dilute and transport air pollutants.

**Table IV.G-3
BAY AREA ATTAINMENT STATUS AS OF DECEMBER 1999**

Pollutant	Averaging Time	Federal Standard ^a		California Standard ^b	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone	1-hour	0.12 ppm	N	0.09 ppm	N ^c
Carbon Monoxide (CO)	1-hour	35 ppm	A ^d	20 ppm	A
	8-hour	9 ppm	A	9.0 ppm	A
Nitrogen Dioxide (NO ₂)	1-hour annual	–	–	0.25 ppm	A
	Annual average	0.053 ppm	A	–	–
Sulphur Dioxide (SO ₂)	1-hour	–	–	0.25 ppm	A
	24-hour	0.14 ppm	A	0.05 ppm	A
	Annual average	0.03 ppm	A	–	–
Suspended Particulates (PM ₁₀)	24-hour annual	150 ug/m ³	U	50 ug/m ³	N
	Annual Arithmetic Mean	50 ug/m ³	A	–	–
	Annual Geometric Mean	–	–	30 ug/m ³	N
Lead (Pb)	30-day average	–	–	1.5 ug/m ³	A
	Calendar quarter	1.5 ug/m ³	A	–	–

A=Attainment N=Nonattainment U=Unclassified

ppm: parts per million

ug/m³: micrograms per cubic meter.

- ^a Federal standards other than for ozone and those based on annual average or annual arithmetic means are not to be exceeded more than once a year. For example, the ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one.
- ^b California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and PM₁₀ are values that are not to be exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average, then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average.
- ^c In June 1995, the Bay Area was redesignated to attainment for the federal ozone standard. However, the EPA changed the Bay Area back to nonattainment in August 1998, due to new exceedances in 1995 and 1996.
- ^d In June 1998, the Bay Area was redesignated to attainment for the federal 8-hour CO standard.

Source: California Air Resources Board and BAAQMD, CEQA Guidelines, 1999.

Benicia has a relatively low natural atmospheric potential for pollution given the persistent and strong winds typical of the area. These winds dilute pollutants and transport them away from the area, so that emissions released in Benicia may influence air quality in the Sacramento and San Joaquin valleys. Benicia's location downwind of the greater Bay Area, however, also means that pollutants from other areas are transported to Benicia.

The major pollutants of concern in the San Francisco Bay Area, ozone, carbon monoxide, and particulate matter, are monitored at a number of locations. The BAAQMD maintains a monitoring site in Benicia, but it monitors only one pollutant; sulphur dioxide, which is primarily released by industrial sources. During

the 5-year period from 1993 to 1997, the Benicia monitoring site did not record any violations of the State or federal standards for sulphur dioxide. The closest multi-pollutant monitoring station to Benicia is located in Vallejo, about eight miles west of Benicia. Data from this monitoring site provides a good general characterization of pollutant levels within Benicia. This monitoring station measures ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate (PM₁₀), and sulfur dioxide levels.

Pollutant monitoring results for the years 1993 to 1997 in Vallejo indicate that air quality in the area north of San Francisco Bay has generally been good. Table IV.G-4 summarizes the last 5 years of published data from this monitoring station. SO₂ data were not listed because no SO₂ exceedance has been recorded in the past 10 years.

As indicated in Table IV.G-4, federal and State carbon monoxide and nitrogen dioxide standards were not exceeded at the Vallejo monitoring station during the 5-year period. Ozone level exceeded the federal standard once in 1995 and none in other years at the Vallejo monitoring station. The more stringent State ozone standard was exceeded from one to six days between 1993 and 1997 at the Vallejo monitoring station. Monitoring of PM₁₀ levels indicated that there were one to three exceedances a year of State PM₁₀ standard recorded except during 1996. Only one exceedance of federal standards (in 1995) was recorded between 1994 and 1997 according to published data from the Vallejo monitoring station.

Benicia appears to have relatively good air quality compared to other parts of the Bay Area. Because of the relatively strong winds and the movement of air between the Bay Area and the Central Valley through the Carquinez Strait, Benicia does not experience the severity of air pollution problems found in other more confined parts of the Bay Area.

e. Planning and Regulatory Framework. BAAQMD is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and from indirect sources (e.g., traffic associated with new development), and for monitoring ambient pollutant concentrations. Indirect sources are facilities that do not have equipment that directly emits substantial amounts of pollution, but that attract large numbers of mobile sources of pollution. Direct emissions from motor vehicles are regulated by the California Air Resources Board (ARB) and U.S. EPA.

(1) Federal Clean Air Act. The federal 1970 Clean Air Act (CAA) authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The federal Clean Air Act Amendments of 1990 (1990 CAA) made major changes in deadlines for attaining National Ambient Air

Table IV.G-4
AMBIENT AIR QUALITY DATA FROM VALLEJO-TUOLUMNE AIR MONITORING STATION

	Carbon Monoxide				Ozone		Fine Suspended Particulates		Nitrogen Dioxide	
	Max. 1-Hour Conc. ^a (ppm)	Number of Days Exceeded	Max. 8-Hour Conc. (ppm)	Number of Days Exceeded	Max. 1-Hour Conc. (ppm)	Number of Days Exceeded	Max. 24-Hour Conc. (µg/m ³)	Number of Days Exceeded	Max. 1-Hour Conc. (ppm)	Number of Days Exceeded
State Stds.	20 ppm/1-hr		9.0 ppm/8-hr		0.09 ppm/1-hr		50 ug/m ³ , 24 hrs ^b		0.25 ppm/1-hr	
1997	7.0	0	4.9	0	.10	1	85	3	.07	0
1996	6.0	0	5.0	0	.11	5	49	0	.07	0
1995	7.0	0	5.3	0	.13	6	59	1	.07	0
1994	9.0	0	6.4	0	.10	2	63	1	.07	0
1993	12.0	0	7.9	0	.11	3	70	3	.08	0
MAXIMUM	12.0		7.9		.13		85		.08	
Federal Stds.	35 ppm/1-hr		9.0 ppm/8-hr		0.12 ppm/1-hr		150 ug/m ³ , 24 hrs		0.053 ppm, ann. avg.	
1997	7.0	0	4.9	0	.10	0	85	0	.014	0
1996	6.0	0	5.0	0	.11	0	49	0	.015	0
1995	7.0	0	5.3	0	.13	1	59	0	.015	0
1994	9.0	0	6.4	0	.10	0	63	0	.016	0
1993	12.0	0	7.9	0	.11	0	70	0	.015	0
MAXIMUM	12.0		7.9		.13		85		.016	

^a ppm: parts per million.

^b µg/m³: micrograms per cubic meter.

Source: ARB/BAAQMD Data, 1993 to 1997.

Quality Standards (NAAQS) and in the actions required of areas of the nation that exceeded these standards. Under the CAA, state and local agencies in areas that exceed the NAAQS are required to develop state implementation plans (SIPs) to show how they will achieve the NAAQS for ozone by specific dates.

The CAA requires that projects receiving federal funds demonstrate conformity to the approved SIP and local air quality attainment plan for the region. Conformity with the SIP may be required. However, since California standards are more strict than federal standards, conformity with the California requirements should also satisfy the CAA requirements. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) are shown previously in Table IV.G-1. Health effects of these criteria pollutants are listed previously in Table IV.G-2.

(2) California Clean Air Act. The California Clean Air Act (CCAA), 1988, requires that all air districts in the state try to achieve and maintain California Ambient Air Quality Standards (CAAQS) for O₃, CO, sulfur dioxide (SO₂), and nitrogen dioxide (NO₂) by the earliest practical date. Plans for attaining CAAQS were submitted to the ARB by June 30, 1991, 1994, and 1997.

The CCAA mandates that districts focus particular attention on reducing emissions from transportation and area-wide emission sources, and the Act provides districts with new authority to regulate indirect sources. Each district plan is to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors.

A strict interpretation of the reduction goals suggests that any general development that increases traffic within the region, no matter how large or small, would have a significant, project-specific air quality impact unless the development-related emissions are offset by concurrent emission reductions elsewhere within the airshed. Any planning effort for air quality attainment would thus need to consider both State and federal planning requirements.

(3) City of Benicia General Plan. The following policies of the Benicia General Plan related to air quality are applicable to the proposed project:

Goal 4.10 **Support improved regional air quality.**

Policy 4.10.1 **Support implementation of the Bay Area Clean Air Plan.**

Program 4.10.B: Require that projects with identified significant air quality impacts include all feasible mitigation measures needed to reduce impacts to less-than-significant levels.

Policy 4.10.2: Encourage design and land use strategies that reduce automobile use and promote mixed use, jobs/housing balance, telecommuting, bicycle, and pedestrian facilities, and transit.

f. Sensitive Receptors. Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Because people in residential districts are often home for extended periods of time, their period of exposure to air pollutants is longer than in other areas, and these land uses are also considered as sensitive. Special consideration must be given to these land uses when localized toxic and CO emissions are of particular concern. Agricultural crops (especially broad-leaved produce crops and cultivated flowers), are also sensitive to air pollutants such as ozone, NO_x, and SO₂.

Industrial and commercial districts are less sensitive to poor air quality because exposure periods are shorter and many of these land uses, by their very nature, produce augmented levels of air pollutants. Recreational land uses are moderately sensitive to air pollution, but those uses where athletic events are promoted are considered more sensitive because vigorous exercise associated with these activities places a high demand on the human respiratory functions which air pollution can impair.

2. Impacts and Mitigation Measures

Development of the proposed Project would generate new air emissions, both during construction and during operation. Specific evaluations of both construction-period and operation-period air quality impacts are provided below.

a. Thresholds of Significance. The determination of impact significance for air quality is based on the BAAQMD criteria as defined in the *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans (Guidelines)*, (BAAQMD, revised December 1999).

The Project would have a significant adverse impact if it would violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. Specifically, a project would have a significant adverse impact if it would:

- Result in substantial emissions or deterioration of ambient air quality. For any individual project, the following emission thresholds are applicable in accordance with the *Guidelines*:
 - Carbon Monoxide: 100 tons/year, 550 lbs/day, 250 kgs/day
 - Hydrocarbons (ROG): 15 tons/year, 80 lbs/day, 36 kgs/day
 - Nitrogen Oxides (NO_x): 15 tons/year, 80 lbs/day, 36 kgs/day
 - Suspended Particulates PM₁₀: 15 tons/year, 80 lbs/day, 36 kgs/day
- Result in CO concentrations that exceed the California Ambient Air Quality Standard of 9 parts per million (ppm) average over eight hours and 20 ppm for one hour.
- Allow land uses that create objectionable odors.
- Alter air movement, moisture, or temperature, or result in any change in climate, either locally or regionally.
- Result in population growth for the jurisdiction that would exceed the values included in the current regional Clean Air Plan.

Construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. Fine particulate matter (PM₁₀) is the pollutant of greatest concern with respect to construction activities. The BAAQMD's approach to CEQA analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. The BAAQMD has identified a set of feasible PM₁₀ control measures for construction activities. The "Basic Measures" should be implemented at all construction sites, regardless of size. The "Enhanced Measures" should be implemented at larger construction sites (greater than 4 acres) where PM₁₀ emissions generally will be higher. The "Optional Measures" may be implemented if further emission reductions are deemed necessary by the Lead Agency.

In addition, the demolition, renovation or removal of asbestos-containing building materials is subject to the limitations of BAAQMD Regulation 11, Rule 2: Hazardous Materials; Asbestos Demolition, Renovation and Manufacturing. The BAAQMD's Enforcement Division should be consulted prior to commencing demolition of a building containing asbestos building materials. Any demolition activity subject to but not complying with the requirements of District Regulation 11, Rule 2 would be considered to have significant impacts.

b. Project Air Impacts. Air quality impacts resulting from Project development can be divided into both short-term and long-term impacts. Short-term impacts are usually associated with construction and grading activities and are not repetitive at a given location. Long-term impacts are typically associated with build-out

conditions, resulting in emissions from mobile and stationary sources. The greatest source of long-term emissions is from the use of vehicles generated from Project implementation. In addition to mobile-generated emissions, air emissions are also associated with stationary and area sources. Of these sources those with the greatest potential for impact are from the on-site combustion of natural gas for space and water heating and the off-site generation of electricity for use on-site.

This air quality analysis was based on the traffic analysis which projects a total of 44,509 daily trips at buildout based on an assumed FAR of 0.25 for retail uses and a FAR of 0.4 for industrial uses.

Screening tables within the *Guidelines* predict that retail use development (regional/community shopping center) may produce a significant impact starting at approximately 80,000 to 125,000 square feet. Industrial use development (such as a warehouse) may produce a significant impact starting at 820,000 square feet. Because the proposed Project exceeds these thresholds for projects likely to generate more than 80 pounds per day of hydrocarbons (ROG), significant impacts would be anticipated based on a screening level analysis. The analysis that follows is intended to provide projected emissions related to Project implementation so that decision-makers have a clear understanding of pollutant loading associated with the Project.

c. Less-than-Significant Impacts.

(1) Carbon Monoxide (CO) Hotspot Analysis. An impact is potentially significant if emissions levels exceed the State standards for CO concentrations in the ambient air. Because CO does not readily disperse into the atmosphere, areas of vehicle congestion create "pockets" of CO called "hotspots." These pockets have the potential to exceed the State 1- hour standard of 20.0 ppm and/or the 8-hour standard of 9.0 ppm.

Because traffic congestion is highest at intersections where vehicles queue and are subject to reduced speeds, these hotspots are typically produced at intersection locations. Typically, the level of service (LOS) at an intersection producing a hotspot is at D or worse.

This analysis is based on intersection analysis provided by Fehr & Peers in the year 2010 and uses background CO concentrations as predicted for the year 2010 in the *Guidelines*. Thirteen intersections were modeled in the Project area. Figures 3 and 4 in the *Guidelines* show that the one hour and eight hour background CO concentrations in the Project area for the 1992 base year would be approximately 3.5 and 4.0 ppm, respectively. For year 2010, the rollback factor is 0.58. Therefore, the year 2010 CO background concentrations are projected to be 2.03 ppm and 2.32

ppm, respectively, for the one hour and eight hour periods. Table IV.G-5 presents the results of this analysis performed for the year 2010 with and without Project scenarios in accordance with the *Guidelines*. Because the projected background CO concentrations are low and the Project would not add substantial amount of traffic-related CO concentrations to the Project area, no exceedances of either the State 1- or 8-hour standards are predicted. The Project would not create a significant impact related to CO concentrations. The proposed Project would add a negligible (0.1 ppm) amount of CO concentrations to the future no project 1-hour and 8-hour CO concentrations, which are much lower than the State and federal CO standards. Local intersections which receive project-generated traffic would not expose local receptors to CO levels in excess of State standards. The Project would not result in a significant impact related to exposing sensitive receptors to substantial CO concentrations.

(2) Consistency With the BAAQMD's Clean Air Plan and the Benicia General Plan. A consistency determination plays an essential role in local agency project review by linking local planning and unique individual projects to the regional air quality plan. It fulfills the CEQA goal of fully informing local agency decision makers of the environmental costs of the Project under consideration at a stage early enough to ensure that air quality concerns are addressed. New or amended General Plan elements, Specific Plans, and significantly unique projects need to undergo a consistency review since the regional air quality plan strategy is based on projections from local General Plans. The proposed commercial/retail and industrial uses would have little or no population growth associated with them. The City of Benicia has demonstrated its reasonable efforts to implement the transportation control measures (TCMs) included in the CAP by incorporating the TCMs in the General Plan and local Master Plans.

ABAG was a co-preparer of the *Bay Area 1997 Clean Air Plan*, which addressed projected growth in the City of Benicia based on the City's General Plan information. Because the Project was included in the General Plan projected growth, it is consistent with the goals of the Clean Air Plan and the City's General Plan and would not result in a significant impact.

Table IV.G-5
YEAR 2010 CO CONCENTRATIONS AT SELECT INTERSECTIONS^a

Intersection	Distance to Roadway Centerline (Feet)	1-Hour CO, ppm^b Without/ With Project	8-Hour CO, ppm^b Without/ With Project
East 2 nd Street and I-780 Eastbound Ramps	18	2.1/2.2	2.4/2.4
	23	2.1/2.1	2.4/2.4
East 2 nd Street and I-780 Westbound Ramps	18	2.1/2.2	2.4/2.4
	23	2.1/2.2	2.4/2.4
East 2 nd Street and Rose Drive	22	2.1/2.2	2.4/2.4
	27	2.1/2.2	2.4/2.4
East 2 nd Street and Industrial Way	18	2.1/2.2	2.4/2.4
	23	2.1/2.2	2.4/2.4
East 2 nd Street and Lake Herman Road	22	2.1/2.2	2.4/2.4
	27	2.1/2.2	2.4/2.4
Lake Herman Road and I-680 Southbound Ramps	8	2.1/2.2	2.4/2.4
	13	2.1/2.2	2.4/2.4
Lake Herman Road and I-680 Northbound Ramps	15	2.3/2.4	2.5/2.6
	20	2.2/2.3	2.4/2.5
Park Road and Industrial Way	18	2.2/2.3	2.4/2.5
	23	2.2/2.2	2.4/2.4
Industrial Way and I-680 Southbound Offramp	8	2.2/2.2	2.4/2.4
	13	2.2/2.2	2.4/2.4
Industrial Way and I-680 Southbound Onramp	12	2.2/2.2	2.4/2.4
	17	2.1/2.1	2.4/2.4
Park Road and Bayshore Road	25	2.1/2.1	2.4/2.4
	30	2.1/2.1	2.4/2.4
Bayshore Road and I-680 Southbound Onramp	8	2.2/2.3	2.4/2.5
	13	2.2/2.2	2.4/2.4
Bayshore Road and I-680 Southbound Offramp	18	2.1/2.1	2.4/2.4
	23	2.1/2.1	2.4/2.4

^a Traffic volumes projected for PM peak hour were used in this analysis.

^b ppm = parts per million. Background CO concentrations in the year 2010 are 2.03 ppm and 2.32 ppm, for the one hour and eight hour periods, respectively.

Source: LSA Associates, Inc., 1999.

(3) Odor and Air Toxics Impact Analysis. There may be some objectionable odors resulting from the operation of diesel-powered equipment during site preparation and construction of the proposed Project. However, these odors would be limited to the short-term and would not be significant.

The proposed Project does not involve any long term uses that would generate objectionable odors. There is no information available at this time on any potential toxic air contaminants associated with the proposed industrial uses on the Project

site. However, any such use proposed in the future would need to comply with the BAAQMD Rules and Regulations on toxic air contaminants, and is not expected to result in any significant impacts. Therefore, no odor or air toxics impact would occur as a result of the proposed Project. No further odor or air toxics impact analysis is required.

(4) Accidental Release/Acutely Hazardous Air Emissions. There is no information available at this time on any potential hazardous air emissions that may be associated with the proposed industrial uses on the Project site. However, any such use proposed in the future would need to comply with the BAAQMD Rules and Regulations. Any accidental release of acutely hazardous air emission would be reported to the City and BAAQMD and handled by the City and/or BAAQMD staff in charge of such issues. Therefore, no significant impact on accidental release and acutely hazardous air emissions would occur as a result of the proposed Project.

d. Potentially Significant Impacts and Mitigation Measures.

Impact AIR-1: The proposed Project would result in long term emissions, including both mobile and stationary sources, that exceed the BAAQMD daily operational thresholds. (S)

(1) Long-Term Mobile Source Emissions. In accordance with the Fehr & Peers Associates Traffic Study, the Project would generate 44,509 trips per day at buildout. The *Guidelines* include emissions factors for vehicles operating within BAAQMD jurisdiction. These emissions factors consider the regional vehicle mix (i.e., percentages of automobiles, light trucks, and heavy trucks) in their prediction. However, the latest version of the ARB's air quality model, URBEMIS7G, was used to predict the emissions associated with project-related vehicular trips. Table IV.G-5 presents emissions associated with Project implementation. Project-generated traffic would produce gaseous emissions in excess of the BAAQMD criterion levels. This impact would be significant.

(2) Long-Term Stationary Source Emissions. Stationary source emissions include both point source emissions, such as those produced from a smoke stack, and area source emissions, such as those produced from space and water heaters. Of the stationary sources of concern, those with the potential to produce the greatest quantities of emissions are those produced at the local power-generating facility and those associated with the on-site combustion of natural gas. Project-generated stationary source emissions would produce gaseous emissions in excess of the BAAQMD criterion levels for NO_x (see Table IV.G-6). This impact would be significant.

Table IV.G-6
PROJECT-GENERATED EMISSIONS AFTER BUILDOUT^a

Source	Vehicle Emissions ^b	Electrical ^b Generation	Natural Gas Combustion	Total Project Emissions	BAAQMD Thresholds for Significance
CO	8920	15	2	8937	550
NO _x	1151	87	6	1244	80
ROG	1026	1	Neg	1027	80
SO _x	Neg ^d	9	Neg	9	NA ^c
PM ₁₀	317	3	Neg	320	80

^a All emissions are in pounds per day.

^b Calculated with emission factors in the 1993 SCAQMD CEQA Air Quality Handbook.

^c Based on 44,509 trips per day at Project buildout. Winter emissions are quoted here for worst case.

^d Neg = Negligible, less than 0.05 pounds per day.

^e NA = Not applicable

Source: LSA Associates, Inc., 1999.

(a) *Electrical Generation.* The major stationary source associated with Project implementation is that associated with the generation of electricity for commercial and industrial uses on-site. The emissions produced by the generation of this electricity were determined in accordance with methodology provided in the South Coast Air Quality Management District (SCAQMD) *CEQA Air Quality Handbook* (1993). This methodology was used after discussion with BAAQMD staff because the BAAQMD *Guidelines* provide no similar methodology.

(b) *Natural Gas Combustion.* Area sources are small sources that individually emit less than 10 tons per year of a criteria pollutant or its precursor. These indirect impacts are unregulated and, although individually small, can make a substantial contribution to regional air quality when summed for the Project overall. The most prominent area source emissions associated with Project implementation are from the combustion of natural gas.

Again, the BAAQMD *Guidelines* do not provide guidance for the quantification of emissions produced from the combustion of natural gas. Although BAAQMD staff suggested that the methodology presented by the SCAQMD would prove to be a viable alternative, the SCAQMD natural gas emissions are based on the number of customers serviced by the proposed industrial use. Due to lack of such information, emissions associated with natural gas consumption are calculated by the URBEMIS7G model. Emissions for this combustion are included in Table IV.G-6. It can be seen that emissions associated with natural gas combustion are generally

small and would not by themselves exceed the BAAQMD daily emissions thresholds for criteria pollutants.

(3) Total Project Long Term Emissions. Total project-related mobile and stationary sources emissions would exceed the BAAQMD daily operational emission thresholds. The following mitigation measures are recommended to be implemented. However, it is not expected that these mitigation measures can reduce the long term Project emissions to below the threshold levels.

Mitigation Measure AIR-1a: Regional air quality will be improved through the implementation of the CAP and other air quality rules and regulations. Implementation of the BAAQMD recommended measures for reducing motor vehicle emissions from commercial, institutional, and industrial projects will help minimize the Project's long term air quality impacts. The following list of selective measures are recommended for the proposed Project:

- Construct transit facilities such as bus turnouts/bus bulbs, benches, shelters, etc.
- Implement carpool/vanpool program e.g., carpool ridematching for employees, assistance with vanpool formation, provision of vanpool vehicles, etc.
- Provide preferential parking for carpool and vanpool vehicles.
- Provide secure, weather-protected bicycle parking.
- Provide safe, direct access for bicyclists to adjacent bicycle routes.
(LTS)

**Impact AIR-2: Depending on the level of construction conducted at any one time, PM₁₀ emissions due to dust generated could exceed the criteria level of 80 pounds per day. Gaseous emissions would add to the local pollutant loading.
(S)**

Short-term emissions are typically associated with construction activities such as the use of heavy equipment and haul and worker trips, but also include dust generation due to grading activities and volatile organic compounds (VOCs) released from the application of asphalt, use of paints and coatings, and dispensation of fuels.

Construction of commercial and industrial buildings would require the use of construction equipment as well as vehicle trips associated both with materials deliveries and worker commutes. The equipment and vehicles would create exhaust pollutants and dust due to site disturbance. With regard to nuisance odors, air quality impacts are typically confined to the immediate vicinity of the equipment

itself. Although brief exposure to exhaust odors may be adverse, it would not be a significant air quality impact.

The *Guidelines* emphasize a qualitative approach to the issue of construction emissions with a focus on comprehensive control measures rather than a detailed quantification of emissions. Gaseous emissions from construction are not subject to impact criteria and any construction impacts are associated with the production of PM_{10} .

Site clearing, grading, and equipment travel on unpaved surfaces could generate considerable quantities of fugitive dust during the development of the Project. At this time, there is no set schedule for construction. Equipment to be used would ultimately depend on the contractor as well as the schedule. Therefore, this analysis focuses on the maximum amount of construction that can proceed at any one time within the Project area before a significant impact would be anticipated. It is estimated that each acre of land disturbed generates 1.2 tons per month (110 pounds per day) of total suspended particulate matter (or PM_{30}) particulate matter from dust lofting into the air. This value would vary with soil moisture, silt content, wind speed, and several other factors. The unhealthful, regulated PM_{10} fraction typically consists of about 45 percent of the PM_{30} fraction or about 50 pounds per acre per day. Based on this value, in the absence of any mitigation, an area of about 1.6 acres could be disturbed on a daily basis and remain within the 80 pounds-per-day criterion. Site watering and other dust control measures, outlined below and typically implemented in any sizeable project, would reduce the dust volume by 50 percent thereby allowing a daily workable area of about 3.2 acres without a significant impact. Assuming that typical dust control measures such as twice daily site watering are implemented, the development of the 527.5 acres would require that grading be spaced over a period of not less than 165 days with the total area restricted to less than 3.2 acres per day to avoid a significant impact.

Mitigation Measure AIR-2a: Prior to the issuance of any grading or building permits, the applicant shall submit a mitigation plan for dust impacts to the City Engineer for review and approval. No construction shall be conducted prior to acceptance of this plan. The plan shall specify construction mitigation measures that shall be incorporated in the project to comply with BAAQMD Regulation 6 that controls particulate matter and visible emissions. Measures such as the following shall be included: watering the site and equipment on a daily basis; covering haul trucks if cut or fill material are to be transported; and sweeping access and local streets.

Mitigation Measure AIR-2b: The “Basic Measures” and “Enhanced Measures” listed in Table IV.G-7 shall be implemented at the Project site. The “Optional Measures” listed in Table IV.G-7 may be implemented if further reduction of emissions is deemed necessary by the City.

Mitigation Measure AIR-2c: The applicant shall include the following measures to reduce emissions from construction equipment exhaust, where feasible: use alternative fueled construction equipment, minimize idling time (e.g., 5-minute maximum), maintain properly tuned equipment, and limit the hours of operation of heavy duty equipment and/or the amount of equipment in use.

Mitigation Measure AIR-2d: Like gaseous emissions, volatile organic emissions (VOE) associated with construction are not subject to significance criteria, but add substantially to the overall pollutant loading in the air basin. The applicant and/or contractor shall use emulsified asphalt or asphaltic cement where feasible. Rapid and medium cure cutback asphalt shall be avoided whenever possible.

Mitigation Measure AIR-2e: The applicant shall use low VOE paints, primers, and coatings, as well as precoated materials, where feasible.

Mitigation Measure AIR-2f: The BAAQMD’s Enforcement Division should be consulted prior to commencing demolition of a building containing asbestos building materials. All demolition activities subject to the requirements of District Regulation 11, Rule 2: Hazardous Materials; Asbestos Demolition, Renovation and Manufacturing shall comply with the requirements of this rule. (LTS)

Table IV.G-7
FEASIBLE CONTROL MEASURES FOR
CONSTRUCTION EMISSIONS OF PM₁₀

<i>Basic Control Measures –</i> The following controls should be implemented at the construction site:
• Water all active construction areas at least twice daily. • Cover all trucks hauling soil, sand, and other loose materials <i>or</i> require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.
<i>Enhanced Control Measures –</i> The following measures should be implemented at the site because it is greater than 4 acres in area:
• All “Basic” control measures listed above. • Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas. • Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.) • Limit traffic speeds on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible.
<i>Optional Control Measures –</i> The following control measures are strongly encouraged at construction sites that are large in area, located near sensitive receptors or which for any other reason may warrant additional emissions reductions:
• Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site. • Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas. • Suspend excavation and grading activity when winds exceed 25 mph. • Limit the area subject to excavation, grading and other construction activity at any one time.

Source: Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, 1999.

H. VISUAL QUALITY

■ ■ ■

This section assesses the effects of the proposed Project on views of the site from nearby public viewpoints. The analysis describes the visual quality of the site and vicinity, relevant policies from the *Benicia General Plan* and public views of the Project site. Visual simulations graphically depict how the Project would appear from selected viewpoints after construction. This section also includes an evaluation of the applicant's proposed design guidelines.

1. Setting

a. Characteristics of the Site and Vicinity. The Project site is located in the northeastern corner of the City of Benicia, upslope from Suisun Bay, just west of Interstate 680 (I-680). Views of the site are shown in Figures IV.H-2 through IV.H-9. Viewpoint locations are shown in Figure IV.H-1.

The Benicia Business Park site is undeveloped. Current land use is grazing. The Project site consists of 527.5 acres of hilly terrain that includes six prominent knolls with intervening drainage swales. The drainage swales contain a variety of wetlands and riparian vegetation, as shown in Figure IV.H-2a. Elevations on site range from 30 feet above mean sea level (msl) in the eastern portion of the site near I-680 to 280 feet above msl on a knoll in the north-central portion of the site. The majority of the Project site is dominated by California annual (non-native) grassland. In the springtime and winter, the hillsides are green and interspersed with wildflowers and mustard, but turn yellow in the summertime as the annual grasses die out. Visible water features present on the Project site consist of portions of four intermittent streams, several seeps and swales, several stock ponds and isolated seasonal wetlands. Water from these streams flows southeast along the Project site, to drain into Suisun Bay. Woody vegetation present on the site consists of individuals and small stands of introduced and native trees. The location of plant communities can be seen in Figure IV.E-1, in the Biological Resources chapter of the EIR.

Two clusters of abandoned farm buildings are present in the portion of the Project site west of Reservoir Road between Lake Herman Road and Lopes Road. A cluster of abandoned farm structures and associated eucalyptus trees are visible from Lake

Herman Road west of the intersection of Reservoir Road. These structures would be removed in order to construct new buildings as part of the proposed Project. The first cluster of buildings, as well as a row of eucalyptus trees, is located south of Lake Herman Road east of the future intersection of Industrial Way and Lake Herman Road. The eucalyptus trees associated with these historic resources are highly visible from Lake Herman Road, and screen the historic structures. A row of eucalyptus trees extend from the northwestern corner of the Project site to a barn complex of three buildings. Building One is a large wood-framed barn approximately 30 by 50 feet, probably historically used for dairy operations. Building Two is a small wood frame barn, possibly for pigs, with a concrete floor. The small barn is approximately 20 by 30 feet. Building Three is a small two-room house or office, approximately 20 by 20 feet.

A second cluster of buildings is located west of Reservoir Road immediately adjacent to the future location of Industrial Way. This area includes an old water tower that has collapsed and the remains of four wood frame buildings with concrete foundations. Due to existing topography, this cluster of buildings is not currently visible from Reservoir Road. However, if the mitigated alternative (see Chapter V) were to be constructed, these buildings would not be removed and would be visible from Industrial Way.

A variety of industrial uses are located to the south of the Project site across East Second Street and adjacent to the Project site to the west. These industrial uses include the Exxon oil refinery and other mixed industrial uses. The mixed industrial uses are characterized by large, low rise buildings. The refinery land is also characterized by large, low rise buildings, as well as oil storage tanks and multiple steam chimneys. Undeveloped lands associated with the Former IT Panoche Facility are located north of and adjacent to the Project site across Lake Herman Road. Existing highway-oriented commercial development, consisting of a combined gas station, convenience market and fast-food establishment, is located to the east of the Project site at the intersection of Lake Herman Road and East Second Street.

b. Significant Public Views of the Site. The site is visible from public roads and viewpoints in and around Benicia, including Lake Herman Road, I-680, East Second Street, Reservoir Road and the City of Benicia water treatment plant. Visual simulations from six viewpoint locations along these public roadways are shown in Section 2, Impacts and Mitigation Measures. The location of these viewpoints is shown in Figure IV.H-1. Views from these six viewpoints are shown in Figures IV.H-4 through IV.H-9 in the Impacts and Mitigation Measures section, below. Existing visual conditions seen from public viewpoints are described below.

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9 Viewpoint location and direction of view

Figure IV.H-1
Viewpoint Locations

Source: LSA Associates, Inc., 2000; James Swanson, 1998.



2a. View of existing lowland vegetation and drainage swales.



2b. View from East Second Street.

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(1) Lake Herman Road. The Project site is visible from numerous locations along Lake Herman Road, including three locations included as visual simulations in Figures IV.H-4 through IV.H-6 in Section 2, Impacts and Mitigation Measures of this section. Views of the site along Lake Herman Road vary as the road changes elevation. Viewpoint locations in the visual simulations include a filtered view from eastbound Lake Herman Road looking southeast (Figure IV.H-4a), a full view from Lake Herman Road looking south with a view of the refinery in the background (Figure IV.H-5a), and another full view looking southeast with the mothball fleet, Mt. Diablo Suisun Bay in the background (Figure IV.H-6a).

As shown in Figure IV.H-4a, from this location just east of the intersection of Reservoir Road, a few large trees near the roadside are prominent visual features, with grass covered hillsides in the background. Due to existing topography, the ground plane of the Project site is barely visible from this viewpoint. In Figure IV.H-5a, a large tree in the foreground, one of the on-site drainage swales and yellowed grass-covered hillsides are visible. The Exxon refinery can be seen beyond the hills of the Project site, with the coastal range visible in the far distance beyond the refinery. Figure IV.H-6a shows another similar view, closer to I-680, of the site's rolling hillsides and a vegetated drainage swale. From this viewpoint, Suisun Bay and the mothball fleet are visible in the background beyond the Project site, with Mt. Diablo visible in the far distance.

The eastern boundary of the Lake Herman Regional Park is located approximately ½ mile west of the Project site along Lake Herman Road. The Project site is separated from Lake Herman Regional Park by intervening hills, and is therefore not visible from the Park.

(2) I-680. The Project site is visible from two locations adjacent to I-680, including the I-680 scenic overlook looking west towards the site, and the I-680 viaduct looking north towards the Project site. Existing industrial uses south of the Project site in the foreground and grass-covered hillsides north of the site in the background are visible in the view from the I-680 viaduct, as shown in Figure IV.H-7a in Section 2, below. From this location, the Project site appears as the narrow base of a larger land formation, the hills that form the northern visual boundary of the view. Existing commercial uses and the grass-covered hillsides of the eastern portion of the Project site are visible from the I-680 scenic overlook, as shown in Figure IV.H-8a.

(3) East Second Street. The Project site is visible from several locations along East Second Street. A view of the Project site from East Second Street just southwest of the I-680 interchange with Lake Herman Road is shown in Figure IV.H-2b. From East Second Street, rolling grass-covered hills dominate views, with occasional openings into drainage swales, with some riparian vegetation visible in

the center of the photo. A view and visual simulation of the Project site from the intersection of East Second Street and Industrial Way looking northwest is shown in Figure IV.H-9. From this location, only grass covered hillsides are visible in the immediate foreground.

(4) Reservoir Road. Reservoir Road passes through the western portion of the Project site. Although the site can now be seen from Reservoir Road, the road would be removed as part of the proposed Project.

(5) Water Treatment Plant. The Project site is visible from the City of Benicia water treatment plant. A view from the upper portion of the water treatment plant is shown in Figure IV.H-3a. As shown in this figure, large riparian trees and other vegetation, as well as grass-covered hillsides of the Project site can be seen from this vantage point. The mothball fleet and Suisun Bay are visible to the east, and the Exxon refinery southwest of the site is also visible. Mt. Diablo is visible in the distant background of this viewpoint.

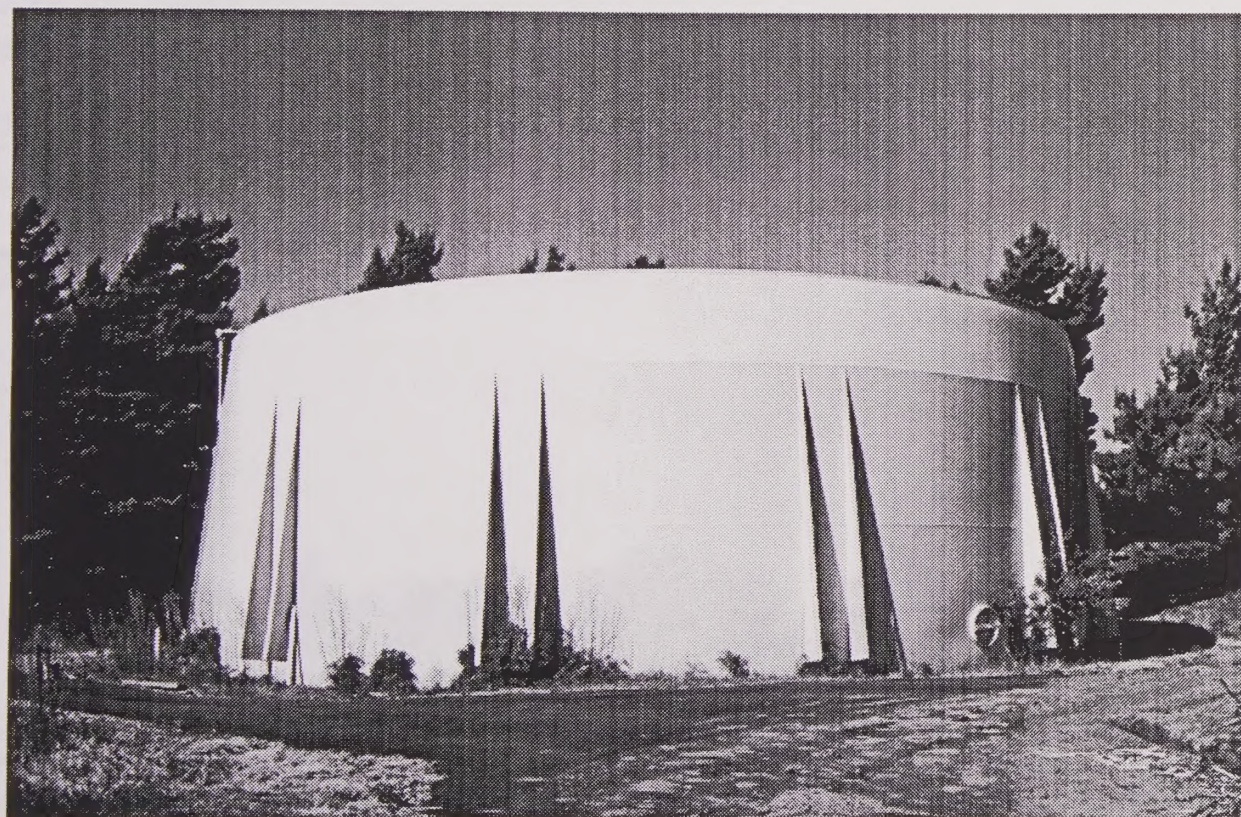
c. Views from the Site. Views from the site include views to industrial areas on East Second Street and the commercial development at the intersection of Lake Herman Road and East Second Street. From the highest points on the northern edge of the Project site, mixed industrial uses are visible south of the site, the Exxon refinery is visible to the southwest of the Project site, and Suisun Bay and the mothball fleet are visible to the east of the Project site. From these locations, the coast range is also visible southeast of the site, with Mt. Diablo visible from several locations.

d. City of Benicia General Plan. The recently adopted *Benicia General Plan* (1999) includes the following goals and policies related to visual impacts and the proposed Project:

- Policy 2.1.1: Ensure that new development is compatible with adjacent existing development and does not detract from Benicia's small town qualities and historic heritage, [and to the extent possible, contributes to the applicable quality of life factors noted above.]
- Policy 3.7.3: Encourage consistent street tree planting, other types of landscaping, and neighborhood gardens.
- Policy 3.7.4: Where feasible, install and maintain landscape (planter) strips that separate sidewalks from the streets.



3a. Panoramic view of site from City of Benicia water treatment plant with refinery on far right and Mt. Diablo in the distance.



3b. Existing water storage tank located adjacent to Project Site at City of Benicia water treatment plant.

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4a. Existing view from eastbound Lake Herman Road at Reservoir Road looking southeast.



4b. Visual simulation after project implementation.

Source: Environmental Vision, 1999.

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5a. Existing view from Lake Herman Road looking south across natural drainage.



5b. Visual simulation after project implementation.

Source: Environmental Vision, 1999.

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6a. Existing view from Lake Herman Road looking southeast towards Mothball Fleet.



6b. Visual simulation after project implementation.

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Figure IV.H-6
Visual Simulation from
Lake Herman Road

- **Goal 3.9:** Protect and enhance scenic roads and highways.
- **Policy 3.9.1:** Preserve vistas along I-780 and I-680.
- **Policy 3.12.1:** Encourage additional attractive, quality development in industrial areas.
- **Policy 3.15.2:** Preserve public views of public open space and maintain existing vistas (including the Northern Area vistas) wherever possible.

The Project's relationship with each of these policies is discussed below under Less-than-Significant Impacts.

e. Design Guidelines. Design Guidelines have been prepared by the Project applicant in order to create and implement the goals and policies of the Benicia Business Park with regard to community identity and quality urban design. The Project applicant has prepared two sets of design guidelines for the Project site. The first set is the Benicia Business Park Master Plan Overlay Limited Industrial Design Guidelines¹, which apply to those portions of the Project site that would have the zoning designation of Limited Industrial. The Limited Industrial Guidelines are consistent with the Industrial Design Guidelines adopted by the City of Benicia in 1989. The Project applicant has also prepared the Benicia Business Park Master Plan Overlay Commercial Design Guidelines for those portions of the Project site that would have the zoning designation of General Commercial.

Since the entire Project site is covered by the Master Plan zoning overlay, the Benicia Business Park Master Plan Overlay Commercial and Limited Industrial Design Guidelines (Design Guidelines) are applicable to the entire Project site. The provisions of these Design Guidelines, submitted to City staff on December 15, 1998,² are applicable to all exterior building construction, changes in materials, repainting (except for some exceptions) and mechanical equipment, as well as new or expanded outdoor facilities, parking, fencing, landscaping and exterior lighting. The Design Guidelines do not apply to changes in permitted uses, interior building modifications needed to accommodate permitted uses, and temporary uses or facilities. Any construction requiring a building permit and subject to design review will adhere to these guidelines.³

¹ It should be noted that the industrial Design Guidelines prepared for the Project site by James R. Swanson Landscape Architect are called "Master Plan Overlay Design Guidelines for Limited Manufacturing Industrial Zoning Designation M-L", instead of Limited Industrial (I-L).

² Seecon, December 14, 1998. *Benicia Business Park Master Plan Overlay Commercial and Limited Industrial Design Guidelines.*

³ Ibid.

The Design Guidelines include provisions for site design; circulation, parking and loading; landscape design; fencing and screening; exterior lighting; architectural design; and Project approval. In addition to these specifications, the Commercial Design Guidelines also make provisions for auto and truck service stations (whereas the Industrial Design Guidelines do not). Specific requirements for design details, including, but not limited to, lot size, building square footages, and landscape planting specifications, are outlined in the City of Benicia Zoning Ordinance Sections 17.32, 17.70 and 17.74.

2. Impacts and Mitigation Measures

a. Thresholds of Significance. Responses to impacts resulting from a change in the visual setting are often subjective. Although individual reactions to physical changes in the environment may vary widely, there are certain community values that can be assumed to determine the level of impact of proposed development on visual resources. This EIR identifies significance criteria based on the *CEQA Guidelines*, the City's General Plan goals and policies and generally accepted urban design principles.

Significant visual impacts would occur if the proposed Project would:

- Substantially change the character of the landscape;
- Result in substantial inconsistency with the character, scale, massing, bulk, and form of surrounding development;
- Create direct visual impacts associated with a conflict with the adopted environmental goals and policies of the *Benicia General Plan*;
- Require substantial terrain modifications;
- Result in a substantial, demonstrable negative aesthetic effect, such as removal or obstruction of a scenic vista or the creation of an aesthetically offensive site open to public view;
- Create significant light or glare; or
- Conflict with adopted City or Project design guidelines.

b. Visual Simulation Methodology and Assumptions. This evaluation of visual impacts resulting from the proposed Project is based on the Project description, photographs taken in the field and visual simulations prepared for this EIR. The six locations for visual simulations were selected based on the visibility of the site from different public viewpoints.

Visual simulations have been prepared to illustrate the conceptual appearance of the proposed development as seen from six locations:

1. Eastbound Lake Herman Road at Reservoir Road looking southeast;
2. Lake Herman Road looking south toward the natural drainage;
3. Lake Herman Road looking southeast (across the mothball fleet);
4. I-680 scenic overlook looking west;
5. I-680 viaduct looking north; and
6. East Second Street at Industrial Way looking northwest.

Photographs taken with a 35mm lens that represent "wide angle" views of approximately 55 degrees have been used for three of the simulations (Views #1, #4 and #6 which correspond to Figures IV.H-4, IV.H-8 and IV.H-9). The other three simulation photographs show a "normal" 50mm lens view angle which is approximately 40 degrees (Views #2, #3 and #5 which correspond to Figures IV.H-5, IV.H-6 and IV.H-7).

Computer modeling and rendering techniques were used to produce visual simulation images. Using digital site grading data, digital modeling of the site terrain was prepared and a set of computer-generated perspective plots were produced that include representation of the commercial and industrial uses proposed on the Project site. Modeling assumptions for the proposed commercial and industrial uses are based prototypical lot development scenarios provided by the Project applicant (see Figures III-4 and III-5) including Master Plan and landscape drawings prepared by James Swanson in September 1998. These prototypical developments were repeated throughout the Master Plan area to create images of the Project site at complete buildout. Since the Project is for a master plan and subdivision, no building details are available. Buildings would undergo individual approval on a lot by lot basis. Therefore, proposed buildings are shown as massings and assumed colors for the proposed buildings include whites, greys and earth tone exterior building facades and trim. The simulations show complete build-out of the Project (through Phase 12 within a 20 year time period). Landscaping for the Project is shown as it would appear 10 years after Project construction.

For each of the viewpoints, the viewer location was digitized from topographic maps using 5 feet as the assumed eye level. Computer "wireframe" perspective plots were overlaid on photographs to verify scale and viewpoint location. Digital visual simulation images were then produced based on computer renderings of the 3-D model combined with digital versions of the selected site photographs. The final "hardcopy" visual simulation images that appear in the EIR were produced from the digital image files.

c. Less than Significant Visual Impacts.

(1) Scale and Character of Development. The proposed Project would not be out of scale or character with surrounding industrial and commercial development south, southwest and northeast of the Project site along East Second Street and Industrial Way. Proposed uses at the Project site include low-rise commercial and industrial uses, and adjacent development also consists of low-rise industrial and commercial development.

(2) General Plan Policies. As outlined in the Setting section, the City's General Plan contains several policies related to protection of visual resources and assessment of visual impacts of projects. The proposed Project would be consistent with General Plan Policy 2.1.1 related to compatibility with existing development, which is industrial in the surrounding area. (The portion of this policy referring to Benicia's small town qualities is assumed to apply to development in the historic downtown portion of the City.) The Project applicant has provided a detailed landscape planting plan which includes provisions for street trees, planting strips and other landscaping. Therefore, the proposed Project would be compatible with General Plan policies 3.7.3 and 3.7.4 related to street tree plantings and planted landscape strips.

The Project would not conflict with *Benicia General Plan* Policy 3.12.1 related to attractive industrial development. Policy 3.12.1 encourages attractive industrial development. Site-specific design review by the City would be required prior to final approval of development proposals for specific sites within the project area. The developer of each lot would submit detailed design specifications for each site for review by City planning staff, consistent with the City's Zoning Ordinance and the applicant's Design Guidelines, prior to final map approval for each site development proposal. This process would ensure that individual development proposals are consistent with this policy.

General Plan Policy 3.9 calls for the protection of scenic roads and highways; General Plan Policy 3.15.2 calls for the preservation of scenic vistas; and General Plan Policy 3.9.1 calls for the preservation of vistas from I-680. (Refer to Table IV.A-1 in the Land Use and Policy section of the EIR.) Potential inconsistencies with these General Plan policies are discussed below under potentially significant impacts in terms of the direct visual effects of Project elements. Direct effects could include being out of character with the landscape; topography modifications; addition of developed structures; or changing views to and from the site.

(3) Impacts to Views. Figure IV.H-7 shows that the existing view from the I-680 viaduct would be largely unchanged, due to the distance from the viewpoint. Existing industrial development is visible in the foreground of the area beyond the freeway and the proposed development would result in an incremental

increase in the amount of development visible against the northern hills; however, this increase would not significantly alter the character of the landscape in this view. The proposed water tower is visible in the center of the photo, but as shown, it is difficult to see because of its distance from the freeway. Therefore, the addition of the proposed Project would be a relatively minor incremental increase in the amount of open hillside blocked from view. No mitigation would be required to address this less-than-significant impact.

(4) Light and Glare. Increased lighting would occur at the Project site in association with new industrial development and public streets. Light spillover into adjacent natural areas within the site and immediately west of the site could create impacts to sensitive wildlife. However, per the Project's industrial Design Guidelines, all security lighting would be indirect, diffused or shielded. City staff would review a detailed lighting plan for each site at the time it is proposed for development. The lighting plan would address all standards for light shading, height, and intensity for areas adjacent to existing undeveloped land and proposed open space as outlined in the California Building Code.

(5) Change in Visual Character. The Project would result in a change in landscape from rural open space to urban development. The industrial and commercial buildings proposed as part of the Project would be inconsistent with the visual character of existing open space and grazing land west and north of the Project site. The visual character in these locations would be changed from rural to industrial. However, this change in character is consistent with the goals of the Benicia General Plan which designates the site for industrial uses. Therefore, this impact would be less-than-significant. No mitigation measures are required to mitigate this impact.

d. Potentially Significant Visual Impacts. As stated in the setting section, public views to and from the site occur from six main locations: I-680; Lake Herman Road; East Second Street; Industrial Way; the I-680 scenic overlook; and the Benicia water treatment plant. The following text describes the potentially significant visual effects of the proposed Project on views at the Project site.

Impact VIS-1: The water towers would be visible from several public viewpoints. These towers would be out of scale and character with adjacent open space. (S)

Two 100-foot diameter, 30-foot height, 1 million gallon water storage tanks are proposed to be installed to supply water to the Project site. A similarly sized water tank located at the water treatment plant adjacent to the site is shown in Figure IV.H-3b. These water tanks would be located atop two knolls located just south of Lake Herman Road. (Although the topography of both knolls would be modified prior to water tank installation, the northern sides of the knolls adjacent to and

visible from Lake Herman Road would not be modified.) One tank, located near the intersection of Lake Herman Road and Industrial Way, would be placed on the southwest side of a regraded, flat portion of the knoll at an elevation of approximately 230 feet. The other water tank would be placed at approximately 260 feet in elevation on a flat pad located on the north side of the knoll, adjacent to Lake Herman Road. The eastern water tank would be more visible from Lake Herman Road due to its location on the north side of the knoll. However, although the western tank would be partially screened by topography, because of their prominent locations at high elevations, and their proximity to Lake Herman Road, both water tanks would be visible from Lake Herman Road, as well as visible in the distance from some locations along East Second Street and I-680. These tanks would be out of character with adjacent open space (although not out of character with nearby visible industrial uses).

Mitigation Measure VIS-1a: The eastern water tank shall be placed on the south side of the hillside, facing the interior of the Project site (if possible while retaining adequate water pressure).

Mitigation Measure VIS-1b: Both water tanks shall be on graded pads set into the hillsides 30 feet so that the tops of the water tanks are minimally or not visible from Lake Herman Road.

Mitigation Measure VIS-1c: The proposed water tanks shall be painted an earth tone color, such as clay or sienna. The color shall be subject to approval by City staff prior to issuance of building permits for the tanks.

Mitigation Measure VIS-1d: The water storage tanks shall be screened as much as possible by vegetation. Trees shall be planted to obscure at least 50 percent of the water tanks within 10 years of final Project buildout. (LTS)

Impact VIS-2: Views from Lake Herman Road would be affected by Project development. (S)

Lake Herman Road is a scenic corridor. The landscape as viewed from this scenic corridor would be impacted by the proposed development. Certain views of the Project site from Lake Herman Road would be partially screened by a landscaped berm between the Project site and Lake Herman Road (the berm is shown in Figure IV.H-4b.) However, in the viewpoint location shown in Figures IV.H-4b, the development would be visible beyond the landscaped berm.



7a. Existing view from I-680 scenic overlook looking west.



7b. Visual simulation after project implementation.

Source: Environmental Vision, 1999.

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As shown in Figure IV.H-5b and Figure IV.H-6b, views of adjacent industrial development southwest of the site already exist, and the proposed Project would not negatively impact scenic vistas from this location. However, the site grading would change the character of the site from a natural hilly grassland to an artificially uniform level site, and the boxlike building forms would block distant views.

Mitigation Measure VIS-2a: The applicant shall develop a detailed landscape plan. The landscape screening in this plan shall be designed to protect views from Lake Herman Road into the interior of the site.

Mitigation Measure VIS-2b: Retention of some of the existing topography would help shield views of the proposed development from the views shown in Figure IV.H-5 and IV.H-6. Maintenance of the hilltop area located in Phases 8 and 10 of the proposed Project site would preserve these views. (Preservation of these hilltops has been included as part of the Mitigated Alternative shown in Chapter V and Figure V-1 of this EIR.) (LTS)

Impact VIS-3: The proposed Project would result in substantial terrain modifications. (S)

Implementation of the proposed Project would involve substantial grading and terrain modification. An estimated 5 to 8 million cubic yards of soil would be excavated from the Project site, as shown in the grading plan in Figure III-9 in the Project Description of this EIR. Cuts would be up to 100 feet deep where hills are removed, and fills, mostly in swales, would be 30 to 50 feet deep.

Mitigation Measure VIS-3: Implementation of Mitigation Measures VIS-2a and VIS-2b would be required. (LTS)

Impact VIS-4: The proposed Project would impact views from several public roadways, including the I-680 Scenic Overlook and Industrial Way. (S)

As shown in Figure IV.H-8b, the view from the I-680 Scenic Overlook towards the site would change due to proposed development and changes in topography. As shown in this photograph, proposed landscaping would help screen some of the development from view. However, much of the development would still be visible.

As shown in Figure IV.H-9b, a grassy berm has been included in the Project plans to help screen the Project from view from Industrial Way at East Second Street. However, as also shown in this figure, some development would still be visible from this location.

Mitigation Measure VIS-4: Final landscaping plans shall include provisions for street and site tree plantings that would be designed to obscure at least 50

percent of the new structures within 5 years of planting. The final landscaping plan shall be subject to approval by City staff prior to final Project approval. This mitigation measure would help minimize visual impacts of the proposed Project from these public roadways which are already located within industrial areas. (LTS)

e. Consistency with Design Guidelines. This section outlines the project's consistency with, and the adequacy of, the Design Guidelines prepared by the project applicant for the Project site. This analysis is based on an analysis of the prototypical lot configurations shown in Figures III-4 and III-5 in the Project Description in light of the Design Guidelines and associated corollary standards from the Benicia Zoning Ordinance. Based on this analysis, the following impact has been identified.

Impact VIS-5: The proposed prototypical site plans and Design Guidelines are inadequate to protect views and integrate the proposed development into the landscape. (S)

Since only conceptual site designs for individual sites are available at this time, compliance with site specific elements of the Design Guidelines (e.g., building setbacks, architectural features, building materials and colors, etc.) would need to be determined during Design Review on a project-by-project basis. Compliance with all specifications of the Design Guidelines shall be confirmed by City staff, prior to specific site design approval.

The conceptual site designs submitted by the Project applicant (as shown in Figure III-4 in the Project Description) are generally consistent with the Design Guidelines in terms of landscaping, street trees, parking and loading docks. However, the Design Guidelines call for variation in wall exteriors in depth and/or direction, and for the use of landscape elements to break up continuous walls, which are not present in every prototype building shown in the conceptual development plans in Figure III-4.

Mitigation Measure VIS-5: Final Project designs shall comply with Design Guideline specifications for wall articulation and varied rooflines prior to final design review approval. (LTS)

As noted in the visual simulation methodology discussion above, the visual simulations assumed prototypical lots with multiple buildings within each phase of development. However, it should be noted that the project applicant has proposed a flat Project site in order to allow for flexibility and the possible occupation of the Project site by one large limited industrial user.



8a. Existing view from I-680 viaduct looking north.



8b. Visual simulation after project implementation.

Source: Environmental Vision, 1999.

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9a. Existing view from E. Second Street at Industrial Way looking northeast.



9b. Visual simulation after project implementation.

Source: Environmental Vision, 1999.

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Figure IV.H-9
Visual Simulation from
East Second Street at Industrial Way

I. CULTURAL RESOURCES

■ ■ ■

This section describes the cultural resources setting, evaluates potential impacts, and recommends mitigation measures to reduce impacts of the proposed Project. This analysis is based on preliminary site reconnaissance and a records search performed by the Northwest Information Center at Sonoma State University for the Project area and vicinity.

1. Setting

A review of records, literature, and maps at the Northwest Information Center at Sonoma State University indicates that no surveys have been completed within the Project area. One survey of the City-owned water treatment plant property adjacent to the Project site was completed in 1977. Other surveys of Lake Herman Road, an electrical transmission line along the western project limits, and of properties to the north were conducted in the late 1980s. No archaeological resources were identified during any of these surveys.

Native American archaeological sites in this portion of Solano County tend to be situated in the vicinity of water sources and particularly along the margins of bays and along creeks. The Project site is located at moderate elevations facing the Suisun Bay. Several ephemeral streams traverse the site and wetland vegetative communities have been identified in the riparian area.

Based on a review of historic maps for the Project area, buildings were noted in the western quarter of the Project area. A site reconnaissance was conducted that focused on identifying potential cultural resources in the portion of the Project site west of Reservoir Road between Lake Herman Road and East Second Street.¹ In general, ground visibility was very poor, typically less than 5 percent.

¹ The remainder of the project site was not surveyed for potential cultural resources.

a. Pre-historic Cultural Resources. An isolated obsidian flake was observed in the northern portion of the site, on level ground about 150 feet from Lake Herman Road (in an area proposed for open space, Lot A). This flake indicates prehistoric use of the project site. Prehistoric sites may be present throughout the Project area with the exception of the small flat knoll at the northeastern corner of the property (at the intersection of Lopes and Lake Herman Roads) which has been previously disturbed. Because this small area of the site was previously disturbed, it is unlikely that any cultural resources will be discovered in this area.

b. Historic Cultural Resources. Three areas containing potentially significant historic resources were identified during the site reconnaissance. These potential resources are located in the western portion of the site only and do not represent a complete list of potential historic resources at the site. The historic resources found in these three areas are described below.

(1) Historic Farm Buildings. A concentration of historic buildings, structures, and landscaping related to earlier farming activities is present in one portion of the Project area. The following features were noted:

- A row of eucalyptus trees extending from the northwestern corner of the property to a barn complex of three buildings.
- A large barn, approximately 30 by 50 feet, probably originally used for dairy operations. One concrete foundation post on this structure was dated 1938.
- A small barn, possibly for pigs, with a concrete floor. The small barn is approximately 20 by 30 feet.
- A small two-room house or office, approximately 20 by 20 feet. The house is raised approximately 2 feet above the existing grade.
- A trash pit south of the pig barn.
- A concrete, octagonal water tower foundation to the south of the trash pit.
- Extensive historic debris throughout the area.

(2) Water Tower and Associated Buildings. An old, collapsed water tower was observed along the western boundary of the site, separate from the cluster of farm buildings noted above. A cluster of buildings located south of the water tower consists of four buildings, one of which was present on a 1959 map. No structures are shown in this area in a historic map from 1909.

(3) Historic and Modern Debris. Historic and modern debris was observed scattered throughout the area east of the water treatment plant. This area

also contains dense eucalyptus growth and may represent the location of other buildings.

2. Impacts and Mitigation Measures

a. Thresholds of Significance. Under CEQA, a Lead Agency is responsible for determining whether a project will have a significant effect on archaeological resources (AB 952, effective January 1, 1983, adding Section 21083.2 to the Public Resources Code). If a project would impact an "important" archaeological resource, mitigation is required. Under Section 21083.2 of the Public Resources Code, a determination of "important" must be made for the archaeological resource. Important archaeological resources are defined as:

- Artifacts, objects, or sites that contain information needed to answer important scientific research questions without merely adding to the current body of knowledge, accompanied by a demonstrable public interest in that information;
- Resources with a special and particular quality such as oldest or best example of its type; or
- Resources directly associated with a recognized important prehistoric or historic event or person.

If a historical resource meets the threshold of 45 years old or older it may be considered eligible for listing in the California Register of Historic Properties. Eligibility must be determined (see criteria above) for affected resources.

b. Impacts and Mitigation Measures.

Impact CULT-1: The possibility exists that undiscovered buried archaeological resources could be present on the Project site. (S)

Based on the findings of the records search performed by the Northwest Information Center, it is possible that archaeological resources exist on the site. Prehistoric resources can include: flakes, projectile points, mortars, pestles, and dark friable soil containing shell and bone dietary debris, heat affected rock, or human burials.

Mitigation Measure CULT-1a: Prior to the issuance of a grading permit, a qualified archaeologist should be retained to complete a Phase I – Assessment Survey of the Project site. Results of this survey, including subsequent recommendations, will be reviewed by the Project applicant and the City, and submitted to the Northwest Information Center for archival purposes. The

Phase I report should include adequate mitigation measures to assure compliance with CEQA and local planning ordinances.

Mitigation Measure CULT-1b: If during Project excavation or construction archaeological resources that were not identified in the Phase I – Assessment Survey are encountered, the following mitigation measures shall be implemented:

- Activity in the vicinity of the suspected resources shall be immediately suspended and the City of Benicia personnel and a qualified archaeologist shall evaluate the find. Project personnel shall not alter any of the uncovered materials or their context.
- If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendent (MLD). With the permission of the landowner or his/her authorized representative, the descendent may inspect the site of the discovery. The descendent shall complete the inspection within 24 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.
- If archeological resources are discovered, and the City and the cultural resource consultant find that the resource is important based on the criteria provided in the *CEQA Guidelines* and criteria listed above, the City and Project developer, in consultation with a cultural resource expert, shall seek to avoid damaging effects on the resource wherever feasible.
- If the City determines that avoidance is not feasible, a qualified cultural resource consultant shall prepare an excavation plan for mitigating the effect of the Project on the qualities that make the resource important. The mitigation plan shall be prepared in accordance with *CEQA Guidelines* and shall be submitted to the City for review and approval. (LTS)

Impact CULT-2: The project would include demolition of farm buildings that are 45 years old or older and that may be historically significant. (S)

Reconnaissance survey of the portions of the site suggest that at least one farm building in the north western portion of the site meets the age threshold for eligibility for the California Register. Other resources at the site include foundations, walls, structures, and refuse deposits. In accordance with CEQA Guidelines Section 15064.5 the project would cause a substantial adverse change in the significance of a historic resource, due to demolition, and would therefore have a potentially significant effect on the environment. Disturbance or destruction of archaeological resources without proper evaluation and appropriate preservation would constitute a significant impact.

Mitigation Measure CULT-2: All potential historic resources at the project site should be identified during the Phase I Assessment Survey (recommended in Mitigation Measure CULT-1, above). A Primary Record Form² should be completed for any potential archeological resources and a Building Structure Object Form³ should be completed for any standing structure.

The results of the Phase I Assessment Survey and completed forms shall be presented in a report to include recommendations of the eligibility of structures at the site for listing in the California Register of Historic Properties. Other applicable mitigation measures to preserve the historic integrity of any potentially significant structures will be outlined. Demolition of existing buildings and structures shall not be permitted prior to completion of the cultural resources survey report. Any recommended mitigation measures outlined in the report to minimize impacts to structures that are determined to be eligible for listing in the California Register of Historic Properties (potentially including preservation or relocation of historic resources) shall be followed. (LTS)

Impact CULT-3: The possibility exists that buried paleontological resources could be present on the Project site. (S)

Disturbance of paleontological resources would constitute a significant impact. A prearranged program for inspecting, documenting, monitoring, and salvaging any

² California Department of Parks and Recreation Forms

³ Ibid.

encountered resources at the Project site would avoid losses to any paleontological resources discovered during construction of the proposed Project.

Mitigation Measure CULT-3: If paleontological resources are encountered during Project construction activities, the following mitigation measures shall be implemented.

- Activity in the vicinity of the suspected resource(s) shall be immediately suspended and the City and a qualified paleontological resource consultant shall be contacted to evaluate the find. Project personnel shall not alter any of the uncovered materials or their context.
- If paleontological resources are discovered and the City and the paleontological resource consultant find that the resource is significant based on the criteria provided in the *CEQA Guidelines*, the City and Project developer, in consultation with a paleontological resource expert, shall seek to avoid damaging effects on the resource wherever feasible.
- If the City determines that avoidance is not feasible, a qualified paleontological resource consultant shall prepare a salvage plan for mitigating the effect of the Project on the qualities which make the resource important. The Project applicant, in consultation with a qualified paleontologist, shall complete a paleontological resource inventory, declaration, and mitigation plan in accordance with the *CEQA Guidelines* and submit it to the City for review and approval. (LTS)

Chapter V

ALTERNATIVES TO THE PROPOSED PROJECT

■ ■ ■

The Benicia Business park, as proposed by the Project applicant, has been described and analyzed in the previous chapters with emphasis on potentially significant impacts and mitigation measures to avoid these impacts. The following discussion is intended to inform the public and decision makers of potentially feasible alternatives to the proposed Project which would attain most of the basic objectives of the Project but would avoid or lessen some of the significant effects of the Project.

A. Alternatives Considered and Rejected

Several development proposals have been considered for the Project site in the past. In 1988, a site plan was developed for a business park at the site. That plan included 115 lots on 319 acres of the site. The proposed grading plan consisted of extensive cut and fill to create a benched building pad configuration. This alternative development proposal was not considered in this EIR because the proposed intensity of development is unrealistic given site constraints and General Plan policies and the Project would result in more visual, land use, and circulation impacts than the proposed Project.

In the early 1990s, a preliminary proposal for an amphitheater was suggested for the site. This alternative land use was not considered in this EIR because it would not conform with the existing zoning and general plan designations for the site.

B. Alternatives Evaluated

Three alternatives which were developed to reduce or eliminate significant environmental impacts of the Project are considered in this EIR. The alternatives under consideration include:

- No Project Alternative in which no development would occur on the site, and existing agricultural uses at the site would continue. CEQA requires that the

Lead Agency consider selection of the No Project alternative as a way to avoid adverse environmental impacts.

- The Mitigated Alternative in which the proposed land uses and site plan would be revised to reduce or avoid impacts identified in the environmental analysis for the proposed Project.
- The Mixed-Use New Concept Alternative, which would provide a mix of uses in a new configuration and with amenities that would benefit the proposed industrial area and the community at large.

A table has been provided on the following page (Table V-1) that shows potentially significant impacts that would be associated with the proposed project, as well as with each alternative, including the No Project Alternative. Impacts for each alternative are considered prior to mitigation. A check mark in the box indicates that the alternative in that column would result in the significant impact listed, prior to mitigation. The purpose of this table is to allow a comparison of major significant impacts between alternatives and the proposed project.

C. No Project Alternative

Under the No Project Alternative the existing use of the site for livestock grazing would remain at the site. Under the No Project Alternative, the site would not be developed for commercial and industrial uses as proposed by the General Plan. There would be no grading, road construction, or installation of utilities. No land subdivision would be approved and the lots would remain in their current configuration.

Under the No Project Alternative, the extensive earthmoving associated with the proposed Project grading plan would not be conducted and new structures would not be built at the site. The potential impacts identified for the proposed Project related to strong seismic shaking, induced slope instability, deformation of deep fills and cut slopes, and shrink-swell potential of on-site soils would be avoided.

The potential impacts identified for the proposed Project related to increases in impervious surfaces (increase in the rate and volume runoff), reduction in runoff water quality associated with increased urban activity and industrial land uses would be avoided with the No Project Alternative.

The potential impacts identified for the proposed Project related to transport, storage, or handling of hazardous materials for heavy machinery operation during site development activities, increased volume and type of hazardous materials at the site

Table V-1
ALTERNATIVES/PROJECT IMPACTS COMPARISON

Impact	Proposed Project	Mitigated Alternative	Mixed-Use Concept	No Project Alternative
<u>GEO-1</u> : Damage caused by strong seismic shaking at the site during the expected earthquakes on regional faults could cause injuries and/or fatalities and structural and non-structural damage to the proposed structures within the Master Plan Area.	✓	✓	✓	
<u>GEO-2</u> : Damage to structures or property could occur at the Master Plan Area due to existing or induced slope instability resulting in land-sliding.	✓	✓	✓	
<u>GEO-3</u> : Potential long-term deformation related to construction of deep fills and potential failure of cut slopes could occur as a result of proposed development.	✓	✓	✓	
<u>GEO-4</u> : Damage to structures or property related to shrink-swell potential of Project soils could occur at the site.	✓	✓	✓	
<u>HYDRÓ-1</u> : Creation of new impervious surfaces could result in increased runoff volume from the site, potentially causing impacts to downstream flooding.	✓	✓	✓	
<u>HYDRO-2</u> : Construction activities and post-construction site uses could result in degradation of water quality in creeks and the Carquinez Strait by reducing the quality of storm water runoff.	✓	✓	✓	
<u>HYDRO-3</u> : Proposed grading at the site will substantially alter surface water drainage patterns, placing several of the on-site creeks and/or drainage swales in buried culverts, potentially reducing the natural ability of the creek system to treat pollutants.	✓	✓	✓	

Table V-1 *continued*

Impact	Proposed Project	Mitigated Alternative	Mixed-Use Concept	No Project Alternative
<u>HAZ-1</u> : Transport, storage, or handling of fuels, lubricants, and other chemicals at the Project site for heavy machinery operation/maintenance during site development activities could result in hazardous materials releases.	✓	✓	✓	
<u>HAZ-2</u> : Proposed site development activities would increase the volume and types of hazardous materials transported, stored, and used within the Project site, causing a potential hazard to public health and safety.	✓	✓	✓	
<u>HAZ-3</u> : Site workers involved in demolition activities within the Project site could be potentially exposed to lead-based paint and asbestos-containing building materials, potentially causing adverse health effects. Site workers involved in development activities could also be potentially exposed to other hazardous materials that may be present on-site.	✓	✓	✓	
<u>HAZ-4</u> : Proposed development within the Project site would attract additional people to light industrial/commercial areas located near grass-land areas, potentially contributing to an increased fire hazard.	✓	✓	✓	
<u>HAZ-5</u> : The proposed Project could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.	✓	✓	✓	
<u>HAZ-6</u> : Workers involved in site grading, earthwork, or demolition activities could encounter hazardous materials within the Project site, for example, unexploded ordnance, explosives, or other hazardous materials, potentially causing physical injuries, death, or other adverse health effects.	✓	✓	✓	
<u>BIO-1</u> : The proposed project would result in the fill of 4.56 acres of jurisdictional wetlands and 0.13 acres of other waters of the U.S.	✓		✓	

Table V-1 *continued*

Impact	Proposed Project	Mitigated Alternative	Mixed-Use Concept	No Project Alternative
BIO-2: The proposed Project could result in indirect impacts to the Suisun Marsh.	✓	✓	✓	
BIO-3: The proposed Project could adversely affect 21 special-status plant species that could occur in wetlands and grassland habitats on the Project site.	✓		✓	
BIO-4: The Project could result in the removal of trees that provide nesting habitat for white-tailed kites and other raptors.	✓		✓	
BIO-5: The proposed Project could result in the loss of nesting and foraging habitat for burrowing owls in the Project vicinity.	✓	✓	✓	
BIO-6: The proposed Project could impact three special-status bat species that may roost in the abandoned buildings on-site.	✓		✓	
TRAN-1: The Project would cause intersection levels of service (LOS) to fall from LOS D or better to LOS E or worse at 7 of the 13 study intersections.	✓	✓	✓	
TRAN-2: Traffic generated by the Project would create the need for a free-right lane at East Second Street/Rose Drive.	✓	✓	✓	
TRAN-3: Traffic generated by the Project would contribute to cumulative traffic impacts by using capacity at all but two of the study intersections, all of which require some form of improvement to accommodate projected future traffic volumes.	✓	✓	✓	
TRAN-4: The Project traffic would create the need for roadway widenings on various segments of East Second Street, Lake Herman Road, Bayshore Road, and Industrial Way.	✓	✓	✓	

Table V-1 *continued*

Impact	Proposed Project	Mitigated Alternative	Mixed-Use Concept	No Project Alternative
<u>TRAN-5:</u> Future traffic volumes with the Project would require roads within the Project site to be wider in some locations than proposed in the Master Plan.	✓	✓	✓	
<u>TRAN-6:</u> The Project would contribute traffic to four freeway segments which are projected to exceed the available capacity in the future. On one of the segments (I-680 Northbound north of Lake Herman Road), the Project traffic causes the over-capacity condition.	✓	✓	✓	
<u>TRAN-7:</u> If off-street parking is not provided at levels consistent with the City of Benicia's zoning ordinance, parking demand could exceed off-street supply, resulting in on-street parking on streets that cannot accommodate parking due to truck access and circulation needs.	✓	✓	✓	
<u>TRAN-8:</u> The Project site plan does not designate sidewalks on the primary traffic-serving streets, which may serve substantial pedestrian travel: Boulevard 'A', Industrial Way between East Second Street and Boulevard 'A', and Park Road north of East Second Street.	✓	✓		
<u>TRAN-9:</u> The need for transit service to the Project site would require Benicia Transit to extend service beyond that currently provided.	✓	✓	✓	
<u>AIR-1:</u> The proposed Project would result in long term emissions, including both mobile and stationary sources, that exceed the BAAQMD daily operational thresholds.	✓	✓	✓	
<u>AIR-2:</u> Depending on the level of construction conducted at any one time, PM ₁₀ emissions due to dust generated could exceed the criteria level of 80 pounds per day. Gaseous emissions would add to the local pollutant loading.	✓	✓	✓	

Impact	Proposed Project	Mitigated Alternative	Mixed-Use Concept	No Project Alternative
<u>VIS-1</u> : The water towers would be visible from several public viewpoints. These towers would be out of scale and character with adjacent open space.	✓	✓	✓	
<u>VIS-2</u> : Views from Lake Herman Road would be affected by Project development.	✓		✓	
<u>VIS-3</u> : The proposed Project would involve substantial terrain modifications.	✓		✓	
<u>VIS-4</u> : The proposed Project would impact views from several public roadways, including the I-680 Scenic Overlook and Industrial Way.	✓	✓	✓	
<u>VIS-5</u> : The proposed prototypical site plans and Design Guidelines are inadequate to protect views and integrate the proposed development into the landscape.	✓	✓	✓	
<u>CULT-1</u> : The possibility exists that undiscovered buried archaeological resources could be present on the Project site.	✓	✓	✓	
<u>CULT-2</u> : The project would include demolition of farm buildings that are 45 years or older, and that may be historically significant.	✓		✓	
<u>CULT-3</u> : The possibility exists that buried paleontological resources could be present on the Project site.	✓	✓	✓	

Source: LSA Associates, 2000.

for industrial activities, worker exposure to hazardous materials during demolition or earthmoving activities, increased number of people in areas subject to grassland fires, and impairment or interference with an adopted emergency response plan or evacuation plan would be avoided at this site.

Under the No Project Alternative the Project site would not contribute to increased traffic. Existing Reservoir Road would remain in its current location and access to and from the site and circulation through the Project site would remain the same.

Impacts related to traffic and air quality as a result of the proposed commercial and industrial uses, would not occur at this site under this alternative. Visual impacts related to grading would not occur. Impacts to biological resources, particularly wetlands, and surface water runoff would not occur under the No Project Alternative.

All of the traffic impacts directly associated with the proposed Project would be avoided if the existing land uses remained at this site. There would be no need for Project-triggered mitigation measures at the study intersections as described in the earlier chapter on transportation impacts, nor would segments of East Second Street, Lake Herman Road, Bayshore Road and Industrial Way require widening beyond what is projected in the General Plan. Since the site is currently used for agricultural and open space purposes, no pedestrian or transit improvements would be needed if the proposed Project were not constructed.

The transportation analysis does identify locations expected to require future improvements with or without the proposed Project. These locations include several freeway segments expected to experience over-capacity conditions, as well as a number of intersections requiring improvements relative to existing conditions. If the Project were not constructed, future traffic volumes at these locations would still make improvements necessary. Since these improvements would be required even without Project implementation, the cost would not be shared by the Project applicant.

The No Project Alternative would eliminate the less-than-significant land use conflict that would result from additional industrial uses in the vicinity of an existing sensitive receptor (the Benicia Bible Church).

The No Project Alternative would avoid the impact to cultural resources associated with the demolition of potentially historic structures. All environmental impacts identified for all other topical areas for the proposed Project would be avoided under the No Project Alternative.

Several adverse factors would occur with implementation of the No Project Alternative. Under the No Project Alternative development of industrial and commercial uses at the Project site would not occur. The site is designated for this type of development in the *Benicia General Plan* and zoning ordinance, and approval of the No Project Alternative would be inconsistent with the General Plan designation for the site. In addition, the No Project Alternative would not create the fiscal benefits of the proposed Project, such as increased retail sales tax and increased employment opportunities. Finally, there would be no creation of 169.8 acres of permanent open space.

D. Mitigated Alternative

1. Introduction

Under the Mitigated Alternative the overall intensity of development would be decreased and the site plan changed to reduce impacts identified in the EIR.

The Mitigated Alternative would generally reduce the intensity of development at the site and would increase the area that would remain as open space. Industrial development would be reduced by about 81 acres. Retail commercial land would be reduced by 4 acres from the amount in the proposed Project. A summary of each land use type of this alternative, as compared to the proposed Project, is shown in Table V-2. Changes in the location of land uses and the impacts that would be mitigated under this alternative, as compared with the proposed Project, are shown in Table V-3.

Development in this alternative would reduce the volume of grading and alteration of landforms in the central knoll and partially mitigate impacts associated with cut slope maintenance. This alternative would also preserve some views from Lake Herman Road (Figure V-1). Existing drainage channels would be maintained to the extent possible to reduce impacts to wetlands. Two farmsteads (one in the northwest portion of the site and another on the western edge of the property) which are potentially significant cultural resource sites would be avoided. Cultural resources identified on lots 45, 46, 32 and a portion of lot 29 would be preserved under this alternative. A fire station and community center site would be provided.

Under this alternative major riparian wetland areas would be protected from development. The Mitigated Alternative would result in a loss of about 1 acre of wetlands compared to the proposed Project, which would result in the loss of 7.6 acres of wetlands. Preservation of riparian trees would also reduce impacts to raptor nesting and breeding habitat.

Under the Mitigated Alternative there would be four travel lanes on "A" Boulevard connecting Lake Herman Road and Industrial Way, with left turn pockets or a two-way left-turn lane. Industrial Way between East Second Street and "A" Boulevard would have four travel lanes. The roadways would be designed to City of Benicia standards, with adequate corner radii, cul-de-sac radii, and lane widths to accommodate typical industrial park vehicles such as semi-trailers. The required roadway width to the City's Major Arterial designation, with a 84-foot right-of-way and 68-foot curb-to-curb width.

Table V-2
LAND USE SUMMARY FOR THE
ALTERNATIVES COMPARED WITH THE PROPOSED PROJECT

Land Use	Proposed Project Gross Area (acres)	Proposed Project Developed Area (sq. ft.)	Mit. Alt. Gross Area (acres)	Mit. Alt. Developed area (sq. ft.)	Mixed Use Gross Area (acres)	Mixed Use Alt. Developed Area (sq. ft.)
Limited Industrial	284.8	4,094,000	203.7	2,928,147 ^a	279.1	4,012,007
General Commercial	45	490,000	45	490,000 ^b	7.6	109,249
Open Space	169.8	N/A	250.3	N/A	38.2	415,998

^a Assumes that Limited Industrial uses would be developed at a density of 14,375 sq. ft./ac

^b Assumes that General Commercial uses would be developed at a density of 10,890 sq. ft./ac

Source: LSA Associates, 1999.

Table V-3
CHANGES IN LOCATIONS OF LAND USES AND
IMPACTS MITIGATED FOR THE MITIGATED
ALTERNATIVE COMPARED TO THE PROPOSED PROJECT

Lot	Proposed Project Use	Mitigated Alternative Use	Mitigated Factor
32, 45 & 46 and a portion of 29	Industrial	Open Space	Cultural Resources
57, 58, 61, 62, 63, 64, 65, 66, 67, 68	Industrial	Open Space	Visual and Slope Stability
52, 54 & 56 and a portion of 24 & 26	Industrial	Retail Commercial	Wetlands
Portion of Lot 29	Industrial	Fire station Community Center	Public Services

Source: LSA Associates, 1999.

VESTING TENTATIVE MAP BENICIA BUSINESS PARK CITY OF BENICIA, CA SEPTEMBER, 1998

UTILITY LEGEND

EXISTING	PROPOSED	DESCRIPTION
		CL SLOPE
		CL GRADE
		TREE TO BE REMOVED
		DRAINAGE SWALES/WATER COURSE
		WETLANDS

①	PHASE NUMBER	NOT
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NOTES:

OWNER: WEST COAST HOME BUILDERS, INC.
4021 PORT CHICAGO HIGHWAY
CONCORD, CA 94524-4153
PHONE: (925) 871-7711

SUBOWNER: WEST COAST HOME BUILDERS, INC.
4021 PORT CHICAGO HIGHWAY
CONCORD, CA 94524-4153
PHONE: (925) 871-7711

ENGINEER: WORTON AND PITALO, INC.
1788 TRIBUTE ROAD, SUITE 200
SACRAMENTO, CA 95815
PHONE: (916) 927-2400

SOILS ENGINEER: EWING
2401 CROW CANYON RD. SUITE 200
SAN RAMON, CA 94583-1545

PRESENT USE: VACANT

PROPOSED USE: COMMERCIAL/LIMITED INDUSTRIAL

PRESENT ZONING: C. B.

PROPOSED ZONING: C. B.

TOTAL GROSS ACREAGE: 527.8

NUMBER OF LOTS: 89

PARK DISTRICT: CITY OF BENICIA

FIRE DISTRICT: CITY OF BENICIA

POLICE: CITY OF BENICIA

WATER DISTRICT: CITY OF BENICIA

STORM DRAINAGE: CITY OF BENICIA

SANITARY SEWER: CITY OF BENICIA

GAS: PACIFIC GAS & ELECTRIC CO.

ELECTRIC: PACIFIC GAS & ELECTRIC CO.

TELEPHONE: PACIFIC BELL

A.P.N.: 80-018-030, 110 AND 120;
80-034-040, 076, 100, 140, AND 160;
181-250-060 AND 070

CONTOURS SHOWN HEREON ARE BASED ON AN AERIAL SURVEY OF THE SITE BY CARTWRIGHT AERIAL SURVEYS, INC. ON 5/17/79.

MULTIPLE FINAL MAPS MAY BE FILED ON THE PROPERTY SHOWN ON THIS VESTING TENTATIVE MAP.

SPECIFIC USES, LOT COVERAGES, BUILDING DIMENSIONS AND PARKING REQUIREMENTS ARE UNKNOWN AT THIS TIME.

THERE ARE NO KNOWN AREAS OF CONTAMINATION ON THE PROJECT SITE.

ALL TREE INFORMATION IS LOCATED ON THE MASTER PLAN.

- Community Center/Fire Station
- Industrial
- Retail Commercial
- Open Space
- Trail

Figure V-1
Mitigated Alternative

2. Mitigating and Adverse Factors and Relationship to Proposed Project

a. Land Use and Policy. No significant impacts to land use were identified for the proposed Project. Therefore, this alternative would not avoid any significant environmental land use impacts. This alternative would not result in the less-than-significant land use impact identified for the Project related to maintenance of open space.

b. Geology, Soils, and Seismicity. Under the Mitigated Alternative, the area affected by, and the amount of, grading would be reduced relative to the proposed Project. The general intensity of development would be decreased. The reduction in grading and development intensity would incrementally reduce the level of impact associated with strong seismic shaking, induced slope instability, deformation of deep fills and cut slopes, and shrink-swell potential of on-site soils relative to the proposed Project.

No adverse effects relative to the proposed Project would be anticipated. However, although this alternative would reduce grading when compared with the proposed Project, it would still result in significant amounts of grading and disturbed soils.

c. Hydrology and Water Quality. Under the Mitigated Alternative, the amount of impervious surfaces and industrial activity would be reduced relative to the proposed Project. The general intensity of development would be decreased. The reduction of construction-period disturbance of the site and operation-period industrial activity would incrementally reduce the level of impact associated with increases in impervious surfaces and reduction in runoff water quality associated with increased urban activity and industrial land uses relative to the proposed Project.

Although this alternative would reduce the level of hydrological impacts when compared with the proposed Project, since some development would still occur under this alternative, all hydrological impacts identified for the proposed project would still occur.

d. Hazardous Materials. The Mitigated Alternative includes less industrial land uses and more open space areas than the proposed Project. Commercial land uses would remain approximately the same. No demolition of structures would occur under the Mitigated Alternative.

The level of impact associated with increased storage of hazardous materials at the site, increased number of people in areas subject to grassland fires, and impairment or interference with an adopted emergency response plan/emergency evacuation plan

would be reduced for the Mitigated Alternative relative to the proposed Project since less industrial development would occur. However, although these impacts would be reduced when compared with the proposed Project, the impacts would still occur.

Mitigating factors for the proposed Project related to hazardous building materials (e.g., lead-based paint and asbestos) would not be required under the Mitigated Alternative since demolition of the farm structures would not occur.

No adverse effects relative to the proposed Project would be anticipated.

e. Biological Resources. The Mitigated Alternative would avoid wetlands and riparian vegetation along major drainage swales that traverse the Project site. Under this alternative a drainage swale that parallels East Second Street near Lots 9, 10, and 11 would be filled and two swales in the western portion of the Project site, that drain both sides of the hill in Lot A would be partially filled. The Project would preserve the other wetland features at the Project site and would reduce the area of wetlands adversely affected by development from 7.4 acres to about one acre.

Under this alternative, potentially historic buildings would be retained and impacts to nesting birds using trees or these buildings on site would be avoided.

The environmental advantages of this alternative include avoidance of impacts to riparian vegetation, grass lands and seasonal wetlands. In addition, the overall reduction in development intensity and the larger open space in the Northern portion of the Project site would reduce impacts to upland wildlife species.

The Mitigated Alternative would not be associated with any additional environmental disadvantages to biological resources that would not occur with implementation of the Project Master Plan.

f. Transportation and Circulation. The primary improvements that this alternative would provide over the proposed Project are:

(1) The total Project-generated traffic would be reduced to approximately 84 percent of that generated by the proposed Project. This traffic generation is roughly equivalent to that generated through mid-phase 11 of the proposed Project. The traffic reduction follows from the net decrease in development density at the site. As a result, the magnitude of the traffic impacts caused by the proposed Project would be lessened. However, the decrease in traffic volumes would not be sufficient to eliminate the need for the intersection mitigation measures or roadway widening requirements identified in the transportation chapter.

(2) Project-generated traffic impacts on freeways in the Benicia area would be reduced. However, the freeway over-capacity conditions identified in the transportation chapter are expected to remain.

(3) Of all the alternatives except the No Project, this alternative would generate the least amount of new traffic. However, as stated above, all of the mitigations needed for the proposed Project would be needed for this alternative, as well.

The Mitigated Alternative would not be associated with any additional environmental disadvantages from traffic that would not occur with implementation of the Project Master Plan.

g. Air Quality. Construction-related emissions would be similar to the proposed Project in that peak daily construction activities would be the same. Total Project construction emissions would be less than those of the proposed Project. Because less on-site development would be constructed under this alternative, fewer additional vehicular trips would be generated at the Project site. Therefore, emissions associated with the additional daily vehicular trips would be less than those associated with the proposed Project. Similarly, project-related increases in CO concentrations at intersections would be less under this alternative. The level of service at these intersections, as well as the local CO levels, would be slightly better under this alternative than those under the proposed Project.

No air quality impacts more adverse than the proposed Project would occur under this Project alternative. However, although air quality impacts would be reduced when compared with the proposed Project, since some development would occur, some air quality impacts would still be expected to occur.

h. Visual Quality. As noted in the visual impacts section of Chapter IV of the EIR, implementation of this alternative would help reduce visual impacts to views from Lake Herman Road, and less terrain modification would occur with this alternative. This reduction in visual impacts would be achieved by retention of some existing landforms in the Phase 8 area of the Project site, referred to as the "Central Knoll," and excluding development from Areas 8 and 10.

i. Cultural Resources. Potential historic resources identified at the Project site would be avoided under the Mitigated Alternative. These include two farmsteads on Lots 29 and 46 and a collapsed water tank on Lot 49.

No additional impacts to historical resources would occur under this alternative.

E. Mixed-Use Alternative

1. Introduction

Under the Mixed-Use alternative a commercial/office/retail uses and fire station/community center complex would be developed at the corner of East Second Street and Industrial Way as shown in Figure V-2. These uses would replace industrial uses at this location proposed by the Project. This alternative offers a greater mix of land use and the public amenity of a community center. The proposed fire station would mitigate project impacts to public services.

The site plan includes a continuous multi-use trail paralleling Lake Herman Road and a greenway connecting the commercial complex with the trail. Both would provide pedestrian and bicycle access through the site to Lake Herman Road. A trail from East Second Street, through the upland portions of the site, to Industrial Way would provide a recreational component to the project that could serve as an extension of recreational uses west of the project site on Lake Herman Road, and connect via Industrial Way to Benicia's residential neighborhoods.

The Mixed-Use alternative would provide approximately 7.6 acres of new office uses and commercial uses would be reduced to 38.2 acres, as compared to the 45 acres currently proposed. A land use summary for the Mixed-use Alternative is provided in Table V-2. The locations of land uses under this alternative compared with the proposed Project are shown in Table V-4.

Table V-4
LAND USE LOCATIONS FOR THE MIXED-USE ALTERNATIVE
COMPARED TO THE PROPOSED PROJECT

Lot	Proposed Project	Mixed-Use Alternative	Mitigating Factors
28	Industrial	Fire Station/comm. center	Public Services
7	Commercial	Industrial	Transportation
26 & 27	Industrial	Office	None
25	Industrial	Retail Commercial	None

Source: LSA Associates, 1999.

VESTING TENTATIVE MAP BENICIA BUSINESS PARK CITY OF BENICIA, CA SEPTEMBER, 1998

UTILITY LEGEND

EXISTING	PROPOSED	DESCRIPTION
		CL SLOPE
		CL GRADE
		TREE TO BE REMOVED
		DRAINAGE SWALES/WATER COURSE

WETLANDS

① PHASE NUMBER NOT

NOTES:

OWNER: WEST COAST HOME BUILDERS, INC.
4021 PORT CHICAGO HIGHWAY
CONCORD, CA 94524-4133
PHONE: (925) 671-7711

SUPPLIER: WEST COAST HOME BUILDERS, INC.
4021 PORT CHICAGO HIGHWAY
CONCORD, CA 94524-4133
PHONE: (925) 671-7711

ENGINEER: MORTON AND PITALO, INC.
1786 TRIBUTE ROAD, SUITE 200
SACRAMENTO, CA 95815
PHONE: (916) 977-2400

SOILS ENGINEER: ENGEL
2461 CROW CANYON RD. SUITE 200
SAN RAMON, CA 94583-1545

PRESIDENT USE: VACANT

PROPOSED USE: COMMERCIAL/LIMITED INDUSTRIAL

PRESIDENT ZONING: C. R.

PROPOSED ZONING: C. R.

TOTAL GROSS ACREAGE: 527.8
NUMBER OF LOTS: 89

PARK DISTRICT: CITY OF BENICIA
FIRE DISTRICT: CITY OF BENICIA
POLICE: CITY OF BENICIA
WATER DISTRICT: CITY OF BENICIA
STORM DRAINAGE: CITY OF BENICIA
SANITARY SEWER: CITY OF BENICIA

GAS: PACIFIC GAS & ELECTRIC CO.
ELECTRIC: PACIFIC GAS & ELECTRIC CO.
TELEPHONE: PACIFIC BELL
A.P.J.

80-010-030, 110 AND 120;
80-038-060, 070, 100, 140, AND 160;
181-260-060 AND 070

CONTOURS SHOWN HEREON ARE BASED ON AN AERIAL SURVEY OF THE SITE BY CARTWRIGHT AERIAL SURVEYS, INC. ON 5/17/79.

MULTIPLE FINAL MAPS MAY BE FILED ON THE PROPERTY SHOWN ON THIS VESTING TENTATIVE MAP.

SPECIFIC USES, LOT COVERAGES, BUILDING DIMENSIONS AND PARKING REQUIREMENTS ARE UNKNOWN AT THIS TIME.

THERE ARE NO KNOWN AREAS OF BRUINATION ON THE PROJECT SITE.

ALL TREE INFORMATION IS LOCATED ON THE MASTER PLAN.

BENICIA BUSINESS PARK

- Office
- Community Center/
Fire Station
- Industrial
- Retail Commercial
- Open Space
- Trail

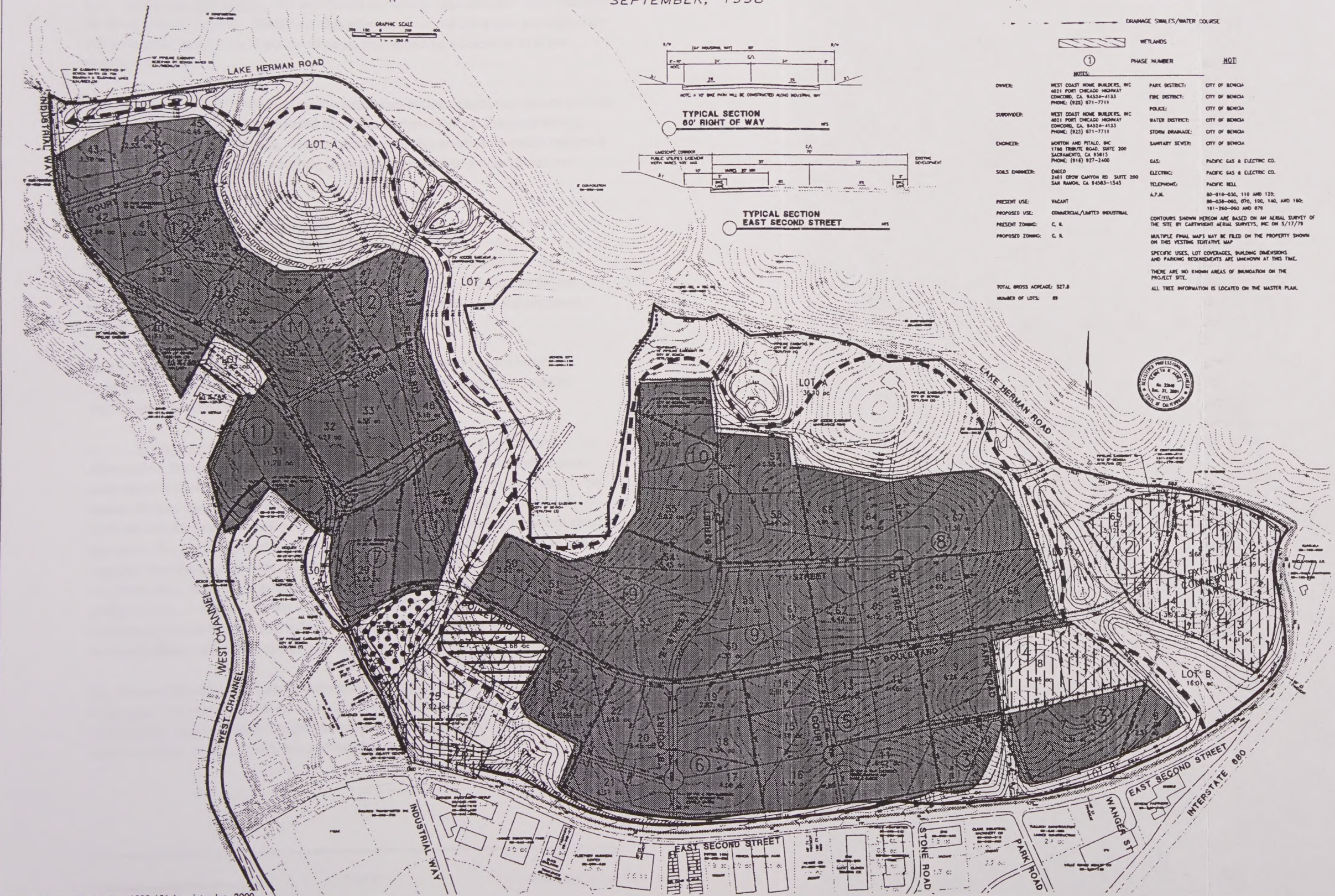


Figure V-2
Mixed Use Alternative

2. Mitigating and Adverse Factors and Relationship to Proposed Project

a. Land Use and Policy. No significant impacts to land use have been identified for the proposed Project. Therefore, this alternative would not avoid any significant environmental land use and policy impacts that would be associated with the proposed project.

This alternative would introduce institutional uses with a community center and fire station. These uses are not provided for in the current General Plan and zoning designations at the Project site. Implementation of this alternative would require a General Plan amendment and zoning designation change, or a conditional use permit.

b. Geology, Soils, and Seismicity. Under the Mixed Use New Concept Alternative, the area affected by, and the amount of, grading would be approximately the same as for the proposed Project. It is expected that this alternative would include similar numbers of occupants and visitors to the site relative to the proposed Project. No mitigating factors relative to the proposed Project would be anticipated.

No adverse effects beyond those identified for the proposed Project would be anticipated. However, this alternative would still result in impacts related to significant amounts of grading and disturbed soils.

c. Hydrology and Water Quality. Under the Mixed Use New Concept Alternative, the amount of impervious surfaces (and therefore potential impacts associated with increases in runoff volume and velocity) would be expected to be similar or less than that for the proposed Project. The amount of impervious surfaces has not been quantified for the Project or the alternatives; however, the inclusion of a greenway and bicycle routes in the Mixed Use Alternative would require less area of impervious surfaces. Although not specified in the description of the alternative, the greenway area could accommodate mitigation features (e.g. grassy swales, detention ponds) to improve runoff quality. In summary, this alternative may provide slight reductions to runoff volume and slight improvement to runoff quality relative to the proposed Project.

No adverse effects beyond those identified for the proposed Project would be anticipated. However, since development would still occur under this alternative, all hydrological impacts identified for the proposed Project would still occur, although some would be lessened with this alternative, as noted above.

d. Hazardous Materials. The mixed-use alternative would be expected to have similar amounts of earthmoving activities, demolition, and site development with potential hazardous materials as the proposed Project. No mitigating factors relative to the proposed Project would be anticipated for the mixed-use alternative.

No adverse effects beyond those identified for the proposed Project would be anticipated. However, impacts identified for the proposed Project related to hazardous materials would still occur.

e. Biological Resources. Impacts to biological resources would be similar to those described for the proposed Project. This alternative would include development in most of the areas proposed for development in the Master Plan, although the land uses would be somewhat different. Biological impacts are largely created by grading and conversion of undeveloped land to developed land. Therefore, this alternative does not offer any substantial environmental advantage over the proposed Project. There would be no additional environmental disadvantages.

f. Transportation and Circulation. The primary improvements that this alternative would provide over the proposed Project are:

(1) The total Project-generated traffic would be reduced to roughly 95 percent of that generated by the proposed Project. This follows from the slight decrease in development density at the site, and from the introduction of office development, which has lower trip generation rates than retail or other commercial uses. As a result, the magnitude of the traffic impacts caused by the proposed Project would be slightly lessened. However, the decrease in traffic volumes would not be sufficient to eliminate the need for the intersection mitigation measures or roadway required widening identified in the transportation chapter.

(2) Project-generated traffic impacts on freeways in the Benicia area would be reduced. However, the freeway over-capacity conditions identified in the transportation chapter are expected to remain.

(3) Due to the location of retail and office uses at the intersection of East Second Street and Industrial Way, more trips would access the Project site from Industrial, and slightly fewer vehicles would access the site from Lake Herman and Park Roads. This shift is not expected to change the required width of any of these roadways.

(4) This alternative would provide additional pedestrian and bicycle facilities through the Project site. These facilities, in combination with the bicycle lockers, sidewalks and other amenities recommended as part of the transportation mitigation measures, may further encourage non-motorized access to the Project site, thus reducing traffic volumes on nearby facilities.

The Mixed Use Alternative would not be associated with any additional environmental disadvantages from traffic that would not occur with implementation of the Project Master Plan.

g. Air Quality. Construction-related emissions would be similar to the proposed Project in that peak daily construction activities would be the same. However, total Project emissions would be less than those of the proposed Project. Since less on-site development would be constructed under this alternative, fewer additional vehicular trips would be generated at the Project site. Therefore, emissions associated with the additional daily vehicular trips would be less than those associated with the proposed Project. Similarly, project-related increases in CO concentrations at intersections would be less under this alternative. The level of service at these intersections, as well as the local CO levels, would be slightly better under this alternative than under the proposed Project.

No air quality impacts more adverse than the proposed Project would occur under the Mixed Use Alternative. However, although this alternative would reduce the total air emissions when compared with the proposed Project, air quality impacts identified for the proposed Project would still occur.

h. Visual Quality. Views from the intersection of Industrial Way and East Second Street would change from the industrial uses proposed in the currently proposed Project to commercial and institutional uses. However, the view from this location would still change from undeveloped to developed land, and would still be significant and unavoidable.

View impacts from East Second Street would be reduced by the addition of a grass-covered berm that would run adjacent to East Second Street from Industrial Way to the existing commercial area adjacent to I-680. Therefore, this potentially significant impact would be avoided with this alternative.

i. Cultural Resources. The Mixed-Use Alternative would be associated with similar impacts to potentially significant historical resources as the proposed Project. No additional impacts to historical resources would occur under this alternative.

F. Environmentally Superior Alternative

The No Project Alternative is considered the environmentally superior alternative because impacts associated with grading and development of the site would be avoided. Impacts identified for the two other development alternatives include, but are not limited to: reductions in visual quality, loss of wetlands, potential loss of cultural resources, and increased traffic and vehicle emissions, when compared to the No Project alternative.

In cases where the No Project Alternative is the environmentally superior alternative, CEQA requires that the second most environmentally superior alternative be identified. Comparison of the environmental impacts associated with each alternative indicates that the Mitigated Alternative is the environmentally superior alternative after the No Project. The Mitigated Alternative would generally be associated with less severe environmental impacts than the Proposed Project because more wetlands area would be avoided, less grading would be required, fewer landforms would be altered and less traffic would be generated. The Mitigated Alternative would meet many of the applicant's stated objectives of the Project. However, it would not meet the Project objective of developing the Master Plan and subdividing the Project area into 69 developable lots.

Chapter VI CEQA-REQUIRED ASSESSMENT CONCLUSIONS

■ ■ ■

As required by the California Environmental Quality Act (CEQA), this chapter provides an overview of the impacts of the proposed Project on several topics. The topics covered in this chapter include growth-inducing impacts; significant irreversible changes; effects not found to be significant; significant unavoidable adverse impacts; and cumulative impacts.

A. Growth-Inducing Impacts

This section summarizes the Project's growth-inducing impacts on the surrounding community. According to CEQA, a project is typically considered growth-inducing if it would foster economic or population growth. Section 15126.2(d) of the *CEQA Guidelines* notes that an EIR should discuss "the ways in which a project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." Examples of projects likely to have significant growth-inducing impacts include extensions or expansions of infrastructure systems beyond what is needed to serve project-specific demand, and development of new residential subdivisions or industrial parks in areas that are currently only sparsely developed or are undeveloped.

The following elements of the Project could potentially have growth-inducing impacts:

- Construction of two new one-million gallon water tanks and extension of water lines, wastewater lines, storm drainage and utilities (electric, gas and telecommunications) to serve the Project; and
- Development of commercial and industrial uses adjacent to open space.
- Employment growth.

1. Construction of Water Tank and New Water Lines

The proposed new water storage tanks, that would together store two million gallons of water, would solely meet the needs of the proposed Benicia Business Park project. The storage capacity provided by the proposed tanks would not serve additional non-project development. Twelve-inch water lines would be installed throughout the Project site, with water provided to these lines only from the two on-site water storage tanks. The Project would be connected to existing municipal sewage mains in East Second Street, with an 8-inch sewer line installed in roadways to serve future uses. Because the on-site storage tanks would provide all water supply to the Project site, sewer supply would be extended from East Second Street from an area that is already developed. Given that the Project is consistent with the General Plan, these potential growth-inducing impacts would be less than significant.

2. Commercial and Industrial Uses Adjacent to Open Space

The Project would be developed adjacent to large open space areas, which are primarily hilly grasslands, along its northern and western borders. The Project site is located along the northern boundary of the City limits. The zoning of adjacent undeveloped County lands is currently _____. A General Plan Amendment and rezoning would be required to allow development on these surrounding lands, and it is unlikely that development of the Project site, which is designated as industrial/commercial land in the General Plan, would trigger growth on adjacent lands, because most of this land is open space and not slated for development. Therefore, growth-inducing impacts would be less than significant.

3. Employment Growth

The proposed Project would create substantial new employment opportunities. Additional jobs at the Benicia Business Park could result in a new market for housing in the City of Benicia and the vicinity. However, the growth of commercial and industrial development at this site is provided for in the General Plan and this growth in the employment sector is taken into consideration in the City's Housing Element. As indicated in the Project Initial Study (Appendix A), there would be less than significant impacts from additional population and employment.

B. Significant Irreversible Changes

CEQA requires that EIRs assess whether the Project would result in significant irreversible changes to the physical environment. The *CEQA Guidelines* describe

three distinct categories of significant irreversible changes that should be considered, as further detailed below.

1. Changes in Land Use Which Would Commit Future Generations

The proposed Project would commit future generations to development of approximately 358 acres of the 527.5-acre Project site. It is unlikely to be economically feasible or prudent to restore the developed portion of the Project site to its pre-development condition as open space in the foreseeable future.

Additionally, most of the 169.8 acres of land that would be designated as open space as part of the proposed Project would be substantially altered by grading, and would be unlikely to return to a natural state because of substantial grading and alteration of drainage and vegetation.

2. Irreversible Changes from Environmental Accidents

Irreversible changes to the physical environment could occur from accidental releases of hazardous materials associated with industrial uses within the proposed Project. However, this potential impact would be expected to be less than significant through compliance with federal, state and local regulations.

3. Consumption of Nonrenewable Resources

CEQA requires that an EIR evaluate the consumption of nonrenewable resources in three areas: increased energy consumption, conversion of agricultural lands, and lost access to mining reserves. The proposed Project would increase energy use as discussed in the Initial Study, Section VIII (Appendix A).

The Project site is currently used for grazing livestock. Impacts to agricultural resources are evaluated in Section I of the Initial Study (Appendix A). The Project would result in the loss of this agricultural resource. However, because the site is not considered farmland of prime or statewide importance, impacts would be less than significant. Mining reserves are not found on the Project site; therefore, the proposed Project would not result in lost access to mining reserves.

C. Effects Found Not to be Significant

An Initial Study (see Appendix A) for the proposed *Benicia Business Park Master Plan* was prepared in order to determine the appropriate analytical scope for this EIR. The Initial Study was based on a preliminary review of issues related to implementation of the *Master Plan*. CEQA-defined environmental factors that were

found to have potentially significant impacts in the Initial Study were Geology, Hydrology, Hazardous Materials, Biology, Transportation, Air Quality, Visual Quality, and Cultural Resources. These topics are evaluated in the EIR along with Land Use, which provides a context for the Project evaluation. Topics found not to have significant impacts which were not analyzed in this EIR include Noise, Public Services, Public Utilities and Energy and Mineral Resources (see Appendix A for discussion of these less-than-significant effects).

D. Significant Unavoidable Adverse Impacts

The proposed Project would result in significant, unavoidable adverse project-specific and cumulative visual impacts that would result from alteration of topography and scenic vistas. All other potentially significant environmental impacts resulting from the project that were identified in Chapter IV of the EIR, can be reduced to a less than significant impact with implementation of recommended mitigation measures. The project would not result in significant unavoidable adverse impacts. One significant unavoidable cumulative traffic impact (TRAN-6) was identified and is discussed in Section IV.F, Transportation and Circulation.

E. Cumulative Impacts

CEQA defines cumulative impacts as “*two or more individual effects which, when considered together, are considerable, or which can compound or increase other environmental impacts.*” Section 15130 of the *CEQA Guidelines* requires that an EIR evaluate potential environmental impacts that are individually limited but cumulatively significant. These impacts can result from the proposed Project alone or together with other projects.

When evaluating cumulative projects, CEQA allows the use of either a list of reasonably-anticipated relevant projects, including projects outside the control of the lead agency, or a summary of projections from an adopted planning document. In order to ensure a comprehensive evaluation, this cumulative impacts analysis uses a combination of both a list of projects as well as information from the *General Plan*. The *1999 General Plan* is used primarily for evaluating cumulative impacts related to transportation, air quality, noise, and services and utilities. Table VI-1 lists four non-residential sites identified in the General Plan but not yet planned for construction and one project that is currently under construction in the vicinity of the Project site. This potential future development, shown in Table VI-1, was used to evaluate cumulative impacts of the Project and alternatives.

**Table VI-1
CUMULATIVE PROJECT LIST**

Project	General Plan Update Site No.	Distance from Project Site	Proposed Land Use	Acres
General Industrial/Open Space Site west of East 2 nd Street in the vicinity of the Industrial Way extension	3	500 feet	Limited Industrial Open Space	114.0 20.0
General Industrial/Open Space Site west of East 2 nd Street	4	¾ mile	Limited Industrial Open Space	236.0 36.0
General Industrial/ Open Space Site east of East 2 nd Street and west of Park Road	5	1¼ mile	Limited Industrial Open Space	23.0 6.0
General Industrial Site at the Intersection of I-680 and I-780	6	2 miles	Limited Industrial	123.0
Open Space site near former gravel mining site east of I-680	10	½ mile	Limited Industrial	24.0
General Commercial (Fahmy) site near the I-680 scenic overlook	20	200 feet	Limited Industrial	19.0
Former Benicia Arsenal Tourtelot property southwest of the Project site	N/A	500 feet	Residential	110.0

Source: *Benicia General Plan*, City of Benicia, 1999.

1. Land Use and Public Policy

a. Cumulative Impacts. There were no significant impacts related to land use identified in Chapter IV of the EIR. The proposed Project, in combination with the other identified projects, would cumulatively increase the overall intensity of commercial and industrial development in the City of Benicia. However, these projects would be consistent with development envisioned in the *Benicia General Plan* and this cumulative impact would be less than significant. Residential uses on the Tourtelot property have been approved by the City, and grading has commenced.

Significant cumulative secondary land use impacts related to conflicts with policies and regulations of resource agencies responsible for wetlands protection, riparian resources and special-status species could also result from the proposed Project, in conjunction with other future nearby projects that could reduce the amount grasslands and wetlands. Direct cumulative impacts that would be associated with these types of natural resource regulatory policy inconsistencies are addressed below under Biological Resources.

- b. Mitigation Measures. Mitigation measures recommended for the Project would adequately mitigate the potential cumulative land use and policy impacts identified. No additional mitigation measures would be necessary. (LTS)

2. Geology, Soils, and Seismicity

- a. Cumulative Impacts. Significant impacts identified for the proposed Project include: 1) damage caused by strong seismic shaking (Impact GEO-1); 2) damage to property associated with slope instability (Impact GEO-2); 3) structural damage to improvements associated with deep cuts and fills (Impact GEO-3); and 4) damage to property and structures associated with shrink-swell soils (Impact GEO-4). Each of these impacts are project- and site-specific, and would not be expected to contribute to regional cumulative impacts. Therefore, cumulative impacts related to geology, soils and seismicity would be less than significant. (LTS)

- b. Mitigation Measures. No additional mitigation would be necessary. (LTS)

3. Hydrology and Water Quality

- a. Cumulative Impacts. Significant impacts identified for the proposed Project include 1) increase in peak runoff volume and velocity (Impact HYDRO-1), 2) degradation of runoff water quality (Impact HYDRO-2), and 3) alteration of surface water drainage patterns, reducing the ability of the natural system to treat pollutants in the runoff (Impact HYDRO-3).

Urbanization has been shown to impact runoff water quality. The Project, in conjunction with other reasonably foreseeable projects (including increased industrial activity) would result in increased urbanization, which would be expected to affect the quality of receiving waters. This combination of projects could contribute to a significant cumulative impact on surface water quality. (S)

- b. Mitigation Measures. Mitigation Measure HYDRO-1 requires that no increase in peak runoff volume occur as a result of Project implementation, and therefore contribution to a cumulative impact would not be expected. No additional mitigation would be required.

City-based and regional programs have been established to address potential cumulative impacts associated with decreased water quality resulting from increased urbanization, including the National Pollutant Discharge Elimination System (NPDES) authorized by the Clean Water Act. The San Francisco Bay Regional Water Quality Control Board (RWQCB) supervises the San Francisco Bay Estuary Institute in the ongoing Regional Monitoring Program for Trace Substances (RMP).

The RMP is the most comprehensive Bay water, sediment, and tissue sampling program established to date, and provides the RWQCB feedback on the effectiveness of clean water programs. It is expected that this program will continue into the future and provides an framework for addressing cumulative water quality impacts associated with development in the Bay Area. No additional mitigation would be necessary. (LTS)

4. Hazards and Hazardous Materials

a. Cumulative Impacts. Significant hazards impacts identified for the proposed Project include: 1) transport, storage, and handling of hazardous materials for heavy machinery operation during site development activities that could result in hazardous materials releases (Impact HAZ-1); 2) increased volumes and types of hazardous materials used at the site (Impact HAZ-2); 3) demolition of structures that potentially contain lead-based paint or asbestos building materials and could cause adverse health effects to workers (Impact HAZ-3); 4) increased number of people in grassland areas subject to fires (Impact HAZ-4); 5) potential impairment or interference with an adopted emergency response/evacuation plan (Impact HAZ-5); and 6) exposure of workers to hazardous materials during site grading activities, potentially causing adverse health effects or injury (Impact HAZ-6). Each of these impacts is site-specific and would not be expected to contribute significantly to cumulative impacts.

Several proposed projects within the City of Benicia are currently under environmental review including: 1) remediation of the Tourtelot property, to the southwest; 2) residential development of the Tourtelot property; and 3) remediation activities and development of a golf course at the former East Canyon Landfill to the west. Each of these sites have been the subject of hazardous materials investigations. Based on information available from these investigations, the Project site has not been impacted by hazardous materials releases, and construction activities would not be expected to contribute to potential cumulative impacts (e.g., reduced air or groundwater quality). All new construction and industrial facilities would comply with applicable laws and regulations pertaining to storage and handling of hazardous materials and no additional contribution to hazardous materials contamination is anticipated. (LTS)

b. Mitigation Measures. For each of the potentially contaminated sites, compliance with all applicable federal, state, and local laws and hazardous materials regulations would reduce any potential cumulative impacts to less-than-significant levels. No additional mitigation would be necessary. (LTS)

5. Biological Resources

a. Cumulative Impacts. Significant impacts identified for the proposed Project that could contribute to cumulative biological impacts include: loss of wetlands (Impact BIO-1), adverse impacts to Suisun Marsh (Impact BIO-2), and loss of habitat for special status plants (Impact BIO-3) and animals (Impacts BIO-4 and BIO-6). (Impact BIO-4 would not be cumulatively significant since trees found to be active raptor nesting sites would be retained. Similarly, Impact BIO-5 calls for the preservation of any burrowing owl nests found on site prior to construction.) Potential loss of wetlands would contribute to an overall decline in the amount of wetlands in the San Francisco Bay-Delta area. The Wetland Mitigation Plan for this project (Sycamore Associates, 2000) provides a detailed plan for replacing wetlands that would be lost as a result of the project. **Therefore, cumulative wetland impacts would be less-than-significant.**

The Project could contribute to degradation of water quality and habitat in Suisun Marsh. Other industrial developments in the vicinity of the Project site, if developed, would also contribute to increased runoff volumes and to increased urban pollutants in runoff. This increase in pollutants in Suisun Marsh would create a significant impact if the population of any species is reduced as a result of the combination of this Project and future projects. Likewise, the reduction in annual grassland and riparian habitats (which could provide potential breeding and foraging habitat for a number of special-status wildlife species, as well as habitat for special-status plant species) would be considered cumulatively significant in combination with similar loss of grassland and riparian habitat in the Project area. (S)

b. Mitigation Measures. Implementation of Mitigation Measure BIO-1 would reduce potential impacts from loss of wetlands at the Project site. However, as noted above, the feasibility and effectiveness of this kind of wetlands mitigation cannot be determined at this time. **Therefore, this impact should be considered cumulatively significant. Similarly, the loss of grassland and riparian habitat would be considered cumulatively significant when considered with other similar habitat losses in the vicinity.** (SU)

6. Transportation and Circulation

a. Cumulative Impacts. The traffic analysis includes an evaluation of 2010 traffic conditions plus the project. Traffic impacts TRAN-5 and TRAN-6 that related to future traffic volumes are cumulative impacts of the project. The project would contribute to a significant and unavoidable cumulative impacts related to future freeway traffic volumes. Refer to Impact TRAN-6 in Section IV.F, Transportation and Circulation. (S)

- b. Mitigation Measures. Refer to Section IV.F, which explains the significant and unavoidable impact related to freeway traffic volumes. (SU)

7. Air Quality

- a. Cumulative Impacts. Cumulative air quality impacts are addressed in Air Quality, Section IV.G of this EIR. Significant impacts were identified related to long-term emissions and construction emissions. Long-term air quality impacts are expected to be reduced to less-than-significant levels, and would not be expected to create a cumulatively significant impact. (LTS)
- b. Mitigation Measures. Refer to Mitigation Measure AIR-1 in Section IV.G, Air Quality which reduces long term air quality impacts to less-than-significant levels. No additional mitigation would be required. (LTS)

8. Visual Quality

- a. Cumulative Impacts. The proposed Project site would be located on undeveloped grassland hills with visible riparian corridors and drainage swales. The site is adjoined by industrial land uses to the south and southwest and commercial uses to the northeast. The addition of the proposed industrial and commercial structures associated with this Project, alteration of topography and the loss of grassland and riparian habitats, in combination with other development projects in the vicinity, would substantially change the visual character of the area. (S)
- b. Mitigation Measures. Although mitigation measures to reduce these visual impacts have been outlined in Section IV.H of this EIR, no mitigation measures could address this cumulatively significant impact. This cumulative visual impact would be significant and unavoidable. (SU)

9. Historic and Cultural Resources

- a. Cumulative Impacts. Potentially significant impacts to cultural resources would be confined to the Project site. No significant cumulative impacts to cultural resources would occur. (LTS)
- b. Mitigation Measures. No mitigation measures would be required. (LTS)

Chapter VII

REPORT PREPARATION

■ ■ ■

A. Report Preparers

LSA Associates, Inc., Prime Consultant: *Project Management and Report Production; Land Use and Policy; Biology Peer Review; Air Quality; Visual Quality; Cultural Resources; CEQA Required Assessment Conclusions; and Alternatives.*

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B. References

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The following table lists the various sources of information used in the preparation of this report. The information was obtained from a variety of sources, including interviews with project staff, review of project documents, and research in the public domain.

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APPENDIX A

INITIAL STUDY



INTRODUCTION

This document is a Draft Negative Declaration/Initial Study in accordance with Section 15070 of the California Environmental Quality Act (CEQA) Statutes and Guidelines. This document contains the following:

- ☐ A Negative Declaration, which briefly summarizes the conclusions of the Initial Study, including potential impacts and mitigation measures.
- ☒ An Initial Study, which identifies environmental issues and determines a project's potential impacts on those issues. The Initial Study determines the level of significance of each impact and provides explanations supporting the conclusions. The conclusions form the basis upon which the lead agency makes its determination of the overall significance of a project's impacts, and the identification of the appropriate environmental review document (i.e., negative declaration, mitigated negative declaration, or environmental impact report).

**INITIAL STUDY
BENICIA BUSINESS PARK MASTER PLAN**

SUMMARY OF ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact." The following pages describe these impacts in greater detail.

X	Land Use and Planning	X	Hazards
X	Population and Housing		Noise
X	Geological Problems		Public Services
X	Water		Utilities and Service Systems
X	Air Quality	X	Aesthetics
X	Transportation/Circulation	X	Cultural Resources
X	Biological Resources	X	Recreation
	Energy and Mineral Resources		Mandatory Findings of Significance

EVALUATION OF ENVIRONMENTAL IMPACTS

Issues (and Supporting Information Sources): Note: A source list is provided at the end of this initial study. Numbers shown after each question in this checklist correspond to specific documents in the source list.	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
I. LAND USE AND PLANNING. Would the proposal:				
a. Conflict with general plan designation or zoning? ^{1,2,3}		X		
b. Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project? ^{1,2,3}		X		
c. Be incompatible with existing land use in the vicinity? ^{4,5}			X	
d. Affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses)? ^{4,5}		X		
e. Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)? ^{4,5}				X

EXPLANATION:

I.a. Conflict with general plan designation or zoning?

The project proposes approval of a Master Plan, a Vesting Tentative Map and a Master Plan Overlay District Rezoning to establish design and development guidelines for the Plan Area. Development standards (including permitted uses, building setbacks and lot coverage) applicable to the project area will continue to be as set forth in the existing Zoning Ordinance for the IL Limited Industrial and CG General Commercial districts. The City has initiated rezoning an 8.8 acre portion of the property located in the southeastern portion of the Plan Area from IL Limited Industrial to CG General Commercial. Rezoning will be addressed in an Environmental Impact Report that will be prepared to evaluate the potential environmental effects the adopted 1999 Benicia General Plan is proposed for anticipated.

I.b. Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project?

The proposed project's consistency with all applicable environmental plans and policies, including policies and regulations of U.S. Army Corps of Engineers, California Department of Fish and Game, Regional Water Quality Control Board, and the City's *Parks, Open Space and Trails Master Plan*, will be assessed in the EIR.

I.c. Be incompatible with existing land use in the vicinity?

Undeveloped lands associated with the Former IT Panoche Facility are located north of and adjacent to the Plan Area across Lake Herman Road. A variety of industrial uses are located to the south of the Plan Area across East Second Street and adjacent to the Plan Area to the west. Existing highway-oriented commercial development consisting of a combined gas station, convenience market and fast-food establishment is located to the east of the Plan Area at the intersection of Lake Herman Road and East Second Street. The proposed project locates commercial development at the eastern end of the Plan Area and industrial development in the central, southern and western portions of the Plan Area. An open space buffer area consisting of primarily undeveloped land is proposed along the south side of Lake Herman Road (see Lot A on the proposed Vesting Tentative Map). Existing land use on site and in the surrounding area will be described, and potential land-use related conflicts with adjacent uses and the proposed project will be assessed in the EIR.

I.d. Affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses)?

The project site is located on land that is undeveloped and currently used for grazing. The area is designated as grazing land in the Important Farmland Mapping Program. The project site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance and no impacts to important farmlands would occur.

I.e. Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)?

The proposed project is generally consistent with the land uses envisioned for the subject property the *Benicia General Plan*, and is not expected to result in the disruption or division of an established community.

IMPACTS AND MITIGATION:

Impacts and mitigation for Land Use and Planning will be outlined in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
II. POPULATION AND HOUSING. Would the proposal:				
a. Cumulatively exceed official regional or local population projections? ^{6,7}			X	
b. Induce substantial growth in an area either directly or indirectly (e.g. through projects in an undeveloped area or extension of major infrastructure)? ^{5,6,7}		X		
c. Displace existing housing, especially affordable housing? ^{5,6,7}				X

EXPLANATION:

II.a. Cumulatively exceed official regional or local population projections?

The proposed project does not include a residential component, and would therefore not increase population on the project site. The project may indirectly lead to some new residential growth in the city as some employees of the future development who do not already reside in the city may choose to relocate to Benicia. However, the proposed project is consistent with long-term planning for the area as designated in both the adopted and proposed Benicia General Plan. Because this amount of industrial and commercial development is considered in the General Plan, buildout of the project is not expected to result in an exceedance of regional population projections.

II.b. Induce substantial growth in an area either directly or indirectly (e.g. through projects in an undeveloped area or extension of major infrastructure)?

The project is generally consistent with the City's long-term planning for the area. However, the project would be comprised of over 358 acres of industrial and commercial uses and infrastructure on currently undeveloped land. In addition, infrastructure (including sewer, water supply, electricity and roads) would be extended to serve the project. These potentially growth inducing effects will be addressed in the EIR under CEQA Conclusions.

II.c. Displace existing housing, especially affordable housing?

The project site is currently undeveloped. Therefore, no housing would be displaced with implementation of the proposed project.

IMPACTS AND MITIGATION:

Potentially growth-inducing effects of the project will be addressed in Chapter VI of the EIR, CEQA-Required Assessment Conclusions.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
III. GEOLOGIC PROBLEMS.				
Would the proposal result in or expose people to potential impacts involving:				
a. Fault rupture? ⁸		X		
b. Seismic ground shaking? ⁸		X		
c. Seismic ground failure, including liquefaction? ⁸		X		
d. Seiche, tsunami, or volcanic hazard? ¹³			X	
e. Landslides or mudflows? ^{4,13}		X		
f. Erosion, changes in topography or unstable soil conditions from excavation, grading, or fill? ^{4,5,8}		X		
g. Subsidence of the land? ⁸		X		
h. Expansive soils? ⁸		X		
i. Unique geologic or physical features? ^{4,5}				X

EXPLANATION:

III.a. Fault rupture?

The proposed project site is located approximately two miles west of the Green Valley fault. Potential hazards related to this nearby fault will be addressed in the EIR.

III.b. Seismic ground shaking?

See response to III.a., above.

III.c. Seismic ground failure, including liquefaction?

See response to III.a., above.

III.d. Seiche, tsunami or volcanic hazard?

There is no potential danger from a seiche or volcanic hazard. Potential hazards from a tsunami will be addressed in the EIR.

III.e. Landslides or mudflows?

The project site is located on gently rolling hilly terrain. Potential hazards from landslides or mudflows will be addressed in the EIR.

III.f. Erosion, changes in topography or unstable soil conditions from excavation, grading, or fill?

The proposed project would involve substantial landform alterations. Slope stability and potential erosional hazards will be addressed in a site-specific geotechnical report to be prepared by the project applicant. This report will be peer reviewed and analyzed in the EIR, and all necessary mitigation to reduce potentially significant impacts will be identified.

III.g. Subsidence of the land?

A site visit and review of a site-specific geotechnical report prepared by ENGEO, Inc., will be performed to determine on-site geological and soil conditions. The results of this peer review and site visit, and the potential impacts of the proposed project in light of these conditions will be outlined in the EIR.

III.h. Expansive soils?

See response to III.g., above.

III.i. Unique geologic or physical features?

See response to III.g., above.

IMPACTS AND MITIGATION:

Impacts and mitigation for potentially significant impacts relating to soils, seismicity and geology will be outlined in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. WATER. Would the proposal result in:				
a. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff? ^{4,5,8}		X		
b. Exposure of people or property to water related hazards such as flooding? ⁸		X		
c. Discharge into surface waters or other alteration of surface water quality (e.g. temperature, dissolved oxygen or turbidity)? ^{4,5,8}		X		
d. Changes in the amount of surface water in any water body? ^{4,5,8}		X		
e. Changes in currents, or the course or direction of water movements? ^{4,5,8}		X		
f. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss or groundwater recharge capability? ^{4,5,8}		X		
g. Altered direction or rate of flow of groundwater? ^{4,5}		X		
h. Impacts to groundwater quality? ^{4,5,8}		X		

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
i. Substantial reduction in the amount of groundwater otherwise available for public water supplies? ^{4,5,8}			X	

EXPLANATION:

IV.a. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?

The proposed project would involve extensive grading and development that will result in changes in absorption rates, drainage and surface water patterns. A site-specific hydrological investigation will be prepared by consultants to the project applicant, and the results will be peer reviewed and analyzed in the EIR. The *Hydrology and Water Quality* section of the EIR will identify all feasible mitigations necessary to reduce potentially significant hydrologic impacts.

IV.b. Exposure of people or property to water related hazards such as flooding?

See response to IV.a., above.

IV.c. Discharge into surface waters or other alteration of surface water quality (e.g. temperature, dissolved oxygen or turbidity)?

See response to IV.a., above.

IV.d. Changes in the amount of surface water in any water body?

See response to IV.a., above.

IV.e. Changes in currents, or the course or direction of water movements?

See response to IV.a., above.

IV.f. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss or groundwater recharge capability?

A site-specific hydrological investigation will be conducted, and the results will be peer reviewed and analyzed in the EIR.

IV.g. Altered direction or rate of flow of groundwater?

See response to IV.f., above.

IV.h. Impacts to groundwater quality?

See response to IV.f., above.

IV.i. Substantial reduction in the amount of groundwater otherwise available for public water supplies?

See response to IV.f., above.

IMPACTS AND MITIGATION:

Impacts and mitigation for potentially significant impacts related to *Hydrology and Water Quality* will be identified in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
V. AIR QUALITY. Would the proposal:				
a. Violate any air quality standard or contribute to an existing or projected air quality violation? ^{5,6}		X		
b. Expose sensitive receptors to pollutants? ^{4,5,6}		X		
c. Alter air movement, moisture, or temperature, or cause any change in climate? ^{5,6}			X	
d. Create objectionable odors? ^{5,6}		X		

EXPLANATION:

V.a. Violate any air quality standard or contribute to an existing or projected air quality violation?

A technical air quality analysis consistent with the Bay Area Air Quality Management District Guidelines for EIR analysis will be prepared as part of the EIR on the proposed Master Plan. The analysis in the EIR will assess the proposed project's compliance with these standards.

V.b. Expose sensitive receptors to pollutants?

The EIR will assess the proposed project's potential impacts on any existing sensitive receptors in the vicinity of the Plan Area.

V.c. Alter air movement, moisture, or temperature, or cause any change in climate?

The EIR will assess the proposed project's potential effects on climatic conditions and odors.

V.d. Create objectionable odors?

See response to V.d., above.

IMPACTS AND MITIGATION:

Impacts and mitigation measures necessary to reduce potentially significant *Air Quality* impacts will be identified in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. TRANSPORTATION/CIRCULATION. Would the proposal result in:				
a. Increased vehicle trips or traffic congestion? ^{4,5,6}		X		
b. Hazards to safety from design features (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)? ^{4,5,6}		X		
c. Inadequate emergency access or access to nearby uses? ^{4,5,6}		X		
d. Insufficient parking capacity on-site or off-site? ^{4,5,6}		X		
e. Hazards or barriers for pedestrians or bicyclists? ^{4,5,6}		X		
f. Conflicts with adopted policies supporting alternative transportation (e.g. bus turnouts, bicycle racks)? ^{4,5,6}			X	
g. Rail, waterborne or air traffic impacts? ^{4,5}				X

EXPLANATION:

VI.a. Increased vehicle trips or traffic congestion?

The EIR on the proposed Master Plan will estimate existing, future background, and future cumulative plus project traffic conditions. The potential effects of build-out of the proposed project on study area roadways and intersections will be assessed against existing level of services standards in the EIR. Impacts on emergency access and City policies regarding pedestrian and bicycle provisions will be assessed.

VI.b. Hazards to safety from design features (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?

See response to VI.a., above.

VI.c. Inadequate emergency access or access to nearby uses?

See response to VI.a., above.

VI.d. Insufficient parking capacity on-site or off-site?

Adequacy of proposed parking facilities will be assessed in the EIR.

VI.e. Hazards or barriers for pedestrians or bicyclists?

See response to VI.a., above.

VI.f. Conflicts with adopted policies supporting alternative transportation (e.g. bus turnouts, bicycle racks)?

The proposed project's consistency with alternative transportation policies will be assessed in the EIR.

VI.g. Rail, waterborne or air traffic impacts?

The proposed project would not have an effect on rail, water or air traffic.

IMPACTS AND MITIGATION:

Impacts and mitigation measures for potentially significant Transportation and Circulation impacts will be identified in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. BIOLOGICAL RESOURCES.				
Would the proposal result in impacts to:				
a. Endangered, threatened or rare species or their habitats (including but not limited to plants, fish, insects, animals, and birds)? ^{4,5,6,9}		X		
b. Locally designated species (e.g. heritage trees)? ^{4,5,6,9}		X		
c. Locally designated natural communities (e.g. oak forest, coastal habitat, etc.)? ^{4,5,6,9}		X		
d. Wetland habitat (e.g. marsh, riparian and vernal pool)? ^{4,5,6,9}		X		
e. Wildlife dispersal or migration corridors? ^{4,5,6,9}		X		

EXPLANATION:

VII.a. Endangered, threatened or rare species or their habitats (including but not limited to plants, fish, insects, animals, and birds)?

A peer review of previous site-specific biological studies prepared for the project applicant and consultation with the California Natural Diversity Data Base will be completed during preparation of the EIR on the proposed Master Plan. The accuracy and adequacy of previously prepared studies will be verified in the field, and the project's potential effects on botanical, wildlife and natural resources will be assessed in the EIR.

VII.b. Locally designated species (e.g. heritage trees)?

See response to VII.a., above.

VII.c. Locally designated natural communities (e.g. oak forest, coastal habitat, etc.)?

See response to VII.a., above.

VII.d. Wetland habitat (e.g. marsh, riparian and vernal pool)?

The proposed project could affect the 7.4 acres of potential Army Corps of Engineers jurisdictional wetlands and 0.17 acres of unvegetated stream channel delineated in an April 1997 report by Sycamore Associates. The project's potential effects on these resources will be assessed in the EIR.

VII.e. Wildlife dispersal or migration corridors?

See response to VII.a., above.

IMPACTS AND MITIGATION:

Impacts and mitigation measures necessary to reduce potentially significant impacts to for biological resources will be assessed in the EIR on the proposed Master Plan.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. ENERGY AND MINERAL RESOURCES. Would the proposal:				
a. Conflict with adopted energy conservation plans? ²				X
b. Use non-renewable resources in a wasteful and inefficient manner? ^{4,5,6}			X	
c. Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State? ^{2,5,6}				X

EXPLANATION:

VIII.a. Conflict with adopted energy conservation plans?

In addition to energy consumption regulations contained in Title 24 of the California Code, the project would be subject to energy conservation policies and regulations contained in the City's General Plan and Zoning Ordinance. Enforcement of Title 24 standards and local policies and regulations would occur during the building permit process for specific industrial or commercial development proposed within the Plan Area pursuant to the proposed Master Plan. No impact would result.

VIII.b. Use non-renewable resources in a wasteful and inefficient manner?

With any construction activity, both renewable and non-renewable resources would be expended for the duration of the project's construction period. The amount of the resources that would be expended for this project would be similar to typical industrial or commercial development. Site preparation and construction will require the use of fuel and building materials, but not in a wasteful or inefficient manner. As for long-term project operation, development of the Plan Area will require extension of energy supply infrastructure. However, all buildings would be subject to compliance with Title 24 standards for energy efficiency to reduce depletion of non-renewable resources. A less than significant impact would result.

VIII.c. Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?

Only one area within the City of Benicia's Sphere of Influence is designated as an area containing regionally significant construction aggregate resources. The proposed project is not located within this area. No impact would result from development within the Plan Area.

IMPACTS AND MITIGATION:

Since no impacts to energy and mineral resources would result, no mitigation would be necessary.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HAZARDS. Would the proposal involve:				
a. A risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation)? ^{4,5,8}		X		
b. Possible interference with an emergency response plan or emergency evacuation plan? ¹²				X
c. The creation of any health hazard or potential health hazard? ^{4,5,8}		X		
d. Exposure of people to existing sources of potential health hazards? ^{4,5,8}		X		
e. Increased fire hazard in areas with flammable brush, grass, or trees? ^{2,4,5,12}			X	

EXPLANATION:

IX.a. A risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation)?

The EIR on the proposed Master Plan will assess the potential for hazardous materials release during construction and project operation.

IX.b. Possible interference with an emergency response plan or emergency evacuation plan?

Because the site is undeveloped, no emergency response plans currently exist at the project site. The EIR on the proposed Master Plan will evaluate the project's potential to interfere with the City's existing Emergency Response Plan. Potential conflict with planned evacuation routes in the vicinity of the project site will be identified. The City of Benicia Fire Department will determine the need for and adequacy of proposed emergency response plans at the time that specific industrial uses are proposed.

IX.c. The creation of any health hazard or potential health hazard?

The EIR will assess past, current, nearby and proposed land uses to describe the potential for exposure to health hazards during project operation.

IX.d. Exposure of people to existing sources of potential health hazards?

See response to IX.c.

IX.e. Increased fire hazard in areas with flammable brush, grass, or trees?

Because the proposed project would involve industrial uses located adjacent to open grassland areas, fire risk in the area would increase. However, the proposed project site would be served by City water lines and two water storage tanks. The project would be subject to review and approval by the Fire Marshal to ensure adequate water supply for firefighting purposes has been provided.

IMPACTS AND MITIGATION:

Impacts and mitigation measures needed to reduce potentially significant public health and safety impacts in the areas of geologic hazards, flooding and water quality hazards and exposure to accidental release of hazardous materials or explosions will be identified in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
X. NOISE. Would the proposal result in:				
a. Increases in existing noise levels? ^{4,5,6,7}			X	
b. Exposure of people to severe noise levels? ^{4,5,6,7}			X	

EXPLANATION:

X.a. Increases in existing noise levels?

The project has the potential to result in increased construction period noise levels, as well as operational noise from stationary sources (industrial users) and traffic noise from project generated traffic.

Construction Period Noise. During construction, noise levels would be temporarily elevated within and in the vicinity of the project site. Some disturbance of people in the vicinity of the project site would be inevitable during site preparation and construction of the buildings. Construction and site preparation would require the use of heavy equipment, such as bulldozers, backhoes, concrete mixers, etc. In addition, trucks, both heavy and light, would be required to haul away material and to deliver building materials. The operation of such equipment would result in the generation of noise above the ambient levels currently experienced in the site vicinity. Construction period noise would be most audible at sites adjacent to the Plan Area and at developed parcels within the Plan Area as new development occurs consistent with the proposed 12-phase phasing plan. Noise levels from construction equipment typically range from about 70 to 95 dBA at a distance of 50 feet.

Noise from localized sources typically decreases by about six dBA with each doubling of distance from source to receptor. For example, outdoor receptors within 200 feet of the source which have an uninterrupted view of the construction site might occasionally experience noise levels that could exceed 83 dBA, especially if multiple pieces of heavy construction equipment were used simultaneously. Such uses would include surrounding industrial and commercial properties. Outdoor receptors within about 400 feet that have an uninterrupted view of the construction site might occasionally experience noise levels in the high 70s dBA if multiple pieces of heavy construction equipment were used simultaneously.

Construction noise levels would be intermittent rather than continuous in nature because different types of construction equipment would be used throughout the construction process. Because construction noise impacts would be intermittent and temporary, and because the surrounding land uses consist primarily of industrial, commercial, and undeveloped lands, these short-term impacts would not be significant. The only noise-sensitive use located in the vicinity of the Plan Area is a church (the Benicia Bible Church) located within an industrial structure in the existing Benicia Business Park south of East Second Street. The church use is located approximately 270 feet from the southern edge of the Plan Area and may experience outdoor noise levels above the existing ambient noise levels during project construction. Because the church is located inside a larger industrial building within an area that is already

zoned and developed with industrial uses, and the main functions of a church typically occur on Sundays and weekday evenings when construction is not allowed, this short-term and intermittent impact would not be considered significant.

b. Operation Period Noise. According to the City's General Plan, existing ambient noise levels within the Plan Area and at properties adjacent to the Plan Area are less than 60 dBA Ldn outside of roadway right-of-ways. Implementation of the project would result in additional sources of stationary noise associated with industrial users as well as increased traffic noise from project generated traffic. The proposed limited industrial and commercial use of the project site is generally consistent with long term planning for the area as designated by the City's General Plan. Additionally, these types of uses would be compatible with existing surrounding industrial and commercial uses.

The City's General Plan identifies performance standards for new development that include stationary noise sources which may effect an existing noise-sensitive development (see Table 4-12 of the General Plan). Commercial and industrial uses are not identified as noise-sensitive uses. However, performance standards for churches are defined. These standards include an exterior hourly Leq dB (the average noise level over the period specified) of 55 dBA from 7 AM to 10 PM and 50 dBA from 10 PM to 7 AM. The interior standard for existing churches which may be affected by new stationary noise sources is 40 dBA for the hourly Leq. In addition, an increase of 3 dBA or greater would constitute a significant effect unless the increase does not cause the standards to be exceeded. As described above, a church is located approximately 270 feet south of the southern boundary of the project site within the interior of an existing industrial structure. Existing ambient day time noise levels at the corner of Reservoir Road and Lake Herman Road 51 to 55. Given the distance of the church use from the proposed project site, and given that the church use is located within a larger industrial structure, it is not expected that stationary noise sources associated with limited industrial development within the Plan Area would cause an increase over 3 dB in the hourly Leq or an exceedance of the standards.

The project would also result in increased noise associated with project generated traffic. The City's General Plan identifies performance standards that apply to proposed noise sensitive land uses with transportation noise sources (see Table 4-11 of the General Plan). No exterior activity area standard is defined for commercial and industrial uses because these are not considered noise sensitive. An interior standard of 45 dBA Leq as determined for a typical worst-case hour during periods of use is defined for interior commercial and industrial spaces requiring "good speech intelligibility" such as offices and conference rooms. In addition, an outdoor standard of 65 dBA Ldn and an interior standard of 45 dBA Ldn is defined for transient lodging including hotel/motel facilities. (For hotel/motel facilities with no proposed outdoor activity areas only the interior standard would apply). Finally an outdoor standard of 60 dBA Ldn and an interior standard of 40 dBA Leq for the worst-case hour during periods of use are defined for churches.

Given current and projected future ambient noise levels, it is expected that standard construction practices would achieve the interior noise standard for commercial and industrial spaces such as offices or conference rooms. Any hotel or motel proposed pursuant to the proposed Master Plan would be required to meet the exterior (as applicable) and interior noise standard which would be enforced during development review of such a proposed use. Traffic generated by the project is not expected to result in a violation of the outdoor or interior noise standard for the existing church located to the south of the Plan Area.

No long-term noise impacts are expected to result from project implementation.

X.b. Exposure of people to severe noise levels?

See response to X.a., above.

IMPACTS AND MITIGATION:

Although construction period project noise is expected to result in a less than significant noise impact, because construction activity can cause severe, albeit temporary, noise disturbances, the following mitigation measures should be implemented. The severity of construction noise impacts would be reduced by these measures, but reduction to the point where no nearby customers or employees would be disturbed would be unlikely. Since there are no residential buildings within the vicinity of the project, there would be no impacts to residents.

Mitigation Measure NOI-1:

1. Adhere to all existing noise control measures identified in the City's Noise Ordinance that are applicable to construction-generated noise.
2. All construction equipment operated at the project site shall be equipped with manufacturer's standard noise control devices (i.e., improved mufflers intake silencers, and/or engine enclosures) to maintain construction noise under levels shown in the Benicia General Plan, where technically and economically feasible. Newer and quieter equipment shall be used whenever possible. All construction equipment shall be inspected at periodic intervals to ensure proper maintenance and hence, lower noise levels.
3. Equipment used for project construction shall have hydraulically or electrically powered impact tools, such as jack hammers, pavement breakers, and rock drills, whenever possible, to avoid noise associated with compressed air exhaust from pneumatically-powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. Quieter procedures shall be used such as drilling rather than impact equipment, whenever feasible.
4. To the extent feasible, stationary construction noise sources shall not be located within 400 feet from existing noise sensitive uses including the existing church use. If noise sources must be located within 400 feet of existing noise sensitive receptors, they shall be adequately muffled or operated at such times as will not interfere with the operation of the church.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. PUBLIC SERVICES. Would the proposal have an effect upon, or result in a need for new or altered government services in any of the following areas:				
a. Fire protection? ^{2,5,6,12}		X		
b. Police protection? ^{2,5,6}			X	
c. Schools? ^{2,5,6}			X	
d. Maintenance of public facilities, including roads? ^{2,5,6}			X	
e. Other governmental services? ^{2,5,6}			X	

EXPLANATION:

XI.a. Fire protection? The City of Benicia Fire Department would continue to provide fire fighting and emergency related services to the Plan Area which is located within the City of Benicia. The Fire Department maintains a staff of approximately 35 fire fighters. The department maintains a response time goal for emergency medical services at 3 to 4 minutes and a fire fighting response time goal of 4 to 5 minutes.

The proposed project would provide for the development of up to approximately 4,094,000 square feet of new limited industrial uses and 490,000 square feet of general commercial uses adjacent to open space areas with primarily grassland vegetative cover. The proximity of open grasslands to adjacent industrial and commercial uses poses a potential fire safety hazard. In addition to this potential hazard, the project would result in an increased demand for fire protection and emergency medical services to serve the new development.

The City has adopted the performance standards defined in the 1997 edition of the Uniform Fire/California Fire Code with a few local amendments to this code. However, the General Plan includes programs that address the City's need to establish specific public services standards, including fire protection (Programs 2.11.C and 2.48.A). In order to ensure that new development in the City has

an acceptable level of service for fire protection, the General Plan EIR concludes that the City would need to establish specific fire protection standards for personnel and facilities, and requires that these Programs 2.11.C and 2.48.A be revised to ensure that standards are established prior to any major new development or infill project.

The General Plan EIR also concluded that in order to maintain existing service levels, any increase in the demand for fire services could require expansion of existing stations or construction of a new station. The project site is currently located approximately a 7- to 8-minute response time from the two existing City fire stations. (Station One is located on Military West south of the Plan Area and the Station Two is located on Hastings Drive west of the Plan Area). The Fire Department has indicated that development within the Plan Area would be outside of an acceptable response time (Carlson, 1999). The Fire Department also anticipates that should a motel or hotel facility be developed within portions of the Plan Area designated for commercial use, the greatest increase in the demand for services associated with the project would be from emergency medical calls. As a Condition of Approval for the proposed project, the Fire Department will request that a new fire station be located on approximately 2½ acres of land located along the Industrial Way extension near the East Second Street intersection. In addition, when the project reaches 50 percent buildout, an additional fire truck would be needed at a current cost of approximately \$250,000. If the proposed project is not implemented, an additional station and truck would not be necessary (Carlson, 1999). In addition, as a Condition of Approval for the proposed project, the Fire Department is considering a request for the proposed project to provide funding for its portion of a new fire facility. The portion to be determined by an analysis, paid by the applicant and conducted prior to final map approval, of the impact the project would have on fire suppression and emergency medical services as well as alternative methods available to generate the required funding. The fire facility would also include a multi-purpose room (for training, an alternate city EOC and community meetings) as well as a satellite office for police services support.

In addition to this anticipated requirement, the proposed project will be subject to review by the Fire Department during the development review process. As specific parcels are proposed for development pursuant to the Master Plan for the proposed business park, the individual site proposals would also be subject to review by the Fire Department during the development review process. The Fire Department's review would address the conformance of the project with locally defined performance standards including the requirements of the Uniform Fire Code as adopted by the Benicia Fire Department. Fire and safety-related issues that would be under the purview of this review include site access and criteria for road widths, road grades, surfacing, load bearing capability and turning radius, the provision of sprinkler systems, stand pipes, smoke detectors and fire alarms, as well as the need for fire resistant landscaping in open space areas and/or the application of other techniques consistent with the Department's vegetation control program for open space fire hazards.

Additionally, the City's Water Division will review the project during the development review process to ensure that adequate water supply is available to meet minimum fire flow requirements for fire suppression. In accordance with Policy 2.58.3 of the General Plan, the project can not be approved unless it is assured that an adequate and dependable water supply is available to serve the project. All buildings, systems and equipment constructed as a result of the proposed project will be subject to the design and construction requirements of the City, Fire Department and California Building Code (CBC) standards. The EIR will discuss phasing of water tank construction.

XI.b. Police protection? The City of Benicia Police Department will continue to provide law enforcement and emergency related services to the Plan Area which is located within the City of Benicia. The Police Department maintains a staff of approximately 50, including 36 sworn officers. The Department's level of service goal is 1.5 officer's per 1,000 residents. As of 1999, the Department had approximately 1.26 officers per 1,000 residents. The department maintains acceptable response times. Average response times are 5 minutes and 10 seconds for Priority 1 calls, 9 minutes for Priority 2 calls and 21 minutes for Priority 3 calls.

The proposed project is generally consistent with the Benicia General Plan. The General Plan EIR considered development of the Plan Area with limited industrial and commercial uses. The General Plan EIR utilizes Association of Bay Area Governments (ABAG) projections to conservatively estimate the population growth anticipated through 2015 under the General Plan. To meet the Department's goal of 1.5 officers per 1,000 residents (an additional three officers would be needed to account for new citywide population growth through 2015 and another four officers to account for the current deficit) under this goal. While the proposed project would not result in the direct addition of residential population to the City, the project would increase the demand for law enforcement services at the project site, and could indirectly lead to some employees of the future development relocating to Benicia. The General Plan EIR has a policy to maintain police services at an officer-to-population ratio approved by the City Council.

The Police Department will review the proposed Master Plan and subsequent individual development applications pursuant to the Master Plan to provide the applicant with measures to ensure that project design and operations deter crime, minimize calls for services and facilitate police response. The project will be subject to existing City, Police Department, and CBC requirements. City and Police Department review is expected to address a number of safety and security related issues including construction site security and fencing, alarm systems and security lighting in parking and pedestrian areas. Additional revenue will help pay for additional officers.

XI.c. Schools The proposed project would not have a direct impact on schools because it does not include a residential component. However, the project could have an indirect impact on the Benicia Unified School District (BUSD) enrollment if some portion of future employees relocate to Benicia and transfer students to BUSD schools. The project's potential impact on BUSD enrollment would be too speculative to quantify. However, consistent with State law (SB50) the BUSD assesses a fee of \$0.31 per square foot for commercial and industrial projects. Development pursuant to the proposed Master Plan would be subject to this fee.

XI.d. Maintenance of public facilities, including roads The proposed project is generally consistent with the City's General Plan and is located entirely within the City. The project would result in an increased demand for maintenance of public facilities and roadways proposed as part of the project. The City would incur costs associated with operation and maintenance of the proposed water tank. However, open space buffers would be provided through public easements. The applicant would develop a non-public mechanism for maintenance of open space buffers.

XI.e. Other governmental services Because the proposed project does not have a residential component, it would not increase local demand for government services provided to residential populations, such as library and health services. The project would incrementally contribute to the demand for certain governmental services such as maintenance of public facilities (see discussion provided in response XI.d). Because the project is consistent with General Plan policy and planning for the area this effect is considered less than significant. Potential impacts to transit providers will be evaluated in the *Traffic and Circulation* section of the EIR on the proposed Master Plan. Potential impacts on the provision of recreation facilities is addressed in the *Recreation* section of this Initial Study.

IMPACTS AND MITIGATION:

With implementation of the City's standard and project specific conditions of approval, the proposed project is not anticipated to result in any potentially significant impacts on Public Services except fire protection.

MITIGATION MEASURE PUB-1: As a Condition of Approval for the proposed project, the Fire Department will request that a new fire station be located 2.5 acres of land located along the Industrial Way extension near Lot #31. In addition, when the project reaches 50 percent buildout, an additional fire truck would be needed at a current cost of approximately \$250,000. If the proposed project is not implemented, an additional station and truck would not be necessary (Carlson, 1999).

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. UTILITIES AND SERVICE SYSTEMS.				
Would the proposal result in a need for new systems or supplies, or substantial alterations to the following utilities:				
a. Power or natural gas?			X	
b. Communications systems?			X	
c. Local or regional water treatment or distribution facilities? ^{2,5,7}			X	
d. Sewer or septic tanks? ^{2,7}			X	
e. Storm water drainage? ^{2,7}			X	
f. Solid waste disposal?			X	
g. Local or regional water supplies? ^{2,5,7}			X	

EXPLANATION:

- XII.a. Power or natural gas?** Power and natural gas service to the Plan Area will be provided by Pacific Gas and Electric Company (PG&E). Extension of electric and gas lines to the Plan Area will be required to serve the proposed project. Because the project is generally consistent with long term planning for the Plan Area, it is expected that adequate service to the Plan Area can be provided. However, extension of service may require substantial alterations or expansions to the existing systems. All existing and proposed utilities would be underground, as required by the City.
- XII.b. Communications systems?** Telephone service to the Plan Area will be provided by Pacific Bell. Extension of telephone lines to the Plan Area will be required to serve the proposed development. Because the project is generally consistent with long term planning for the Plan Area, it is expected that adequate service to the Plan Area can be provided. However, extension of service may require substantial alterations or expansions to the existing systems. All existing and proposed utilities would be underground, as required by the City.
- XII.c. Local or regional water treatment or distribution facilities?** The City's Water Treatment Plant is located adjacent to the project site. According to the General Plan EIR, the treatment plant has a capacity of 12 million gallons per day (mgd). The City expects to expand the capacity to 18 mgd by 2009. As part of the project, two water storage tanks would be developed adjacent to the treatment.
- The project would result in the need for extension of new distribution facilities. However, given that the project is consistent with the General Plan and that the project will be subject to the City's standard Conditions of Approval relating to the extension of water service, including assessment of fees for the costs of on-site and off-site improvement necessary to serve the project, this impact is considered less than significant.
- XII.d. Sewer or septic tanks?** According to the General Plan EIR, the City has projected wastewater flows for the anticipated population growth through 2015. These projections have been based on ABAG's Projections 96, which include more development than is anticipated under the General Plan. Improvements that are planned for implementation through the Wastewater Treatment Plant Improvement Project are expected to adequately meet the City's demand for sewer services through the forecast year of 2015. The City has determined that the project would not exceed existing wastewater conveyance or treatment capacity. The project would result in the need for extension of sewer lines. As part of the City's development review process, the project applicant will be assessed fees to cover the fair share cost of all on-site and off-site

improvements necessary to serve the project.

- XII.e. Storm water drainage?** The existing storm drainage facilities that would serve the project site are operated by the City of Benicia. The project would result in substantial alterations to existing drainage patterns and increases in impervious surfaces. Storm water runoff from the proposed development is planned to be collected in a new onsite collection system for conveyance to the existing City storm water drainage system. The City has determined that storm drainage facilities proposed by the project and those improvements required by the City would be adequate to serve the project site. The applicant will be assessed fees to cover the costs of all system improvements required to serve the project.
- XII.f. Solid waste disposal?** The proposed project would result in an incremental increase in the generation of solid waste. Solid waste disposal services to the Plan Area will be provided by PHBD. PHBD will transport waste collected within the Plan Area to the Keller landfill. This facility is expected to operate for another 100 years. The project will be subject to the requirements of the California Waste Management Act of 1989 and the California Solid Waste Reuse and Recycling Act of 1991. No analysis of the waste transfer and recovery was completed in the General Plan EIR.
- XII.g. Local or regional water supplies?** Water to the project site would be supplied by a combination of existing water lines, water main extensions and associated water pumps. The project also includes the construction of two water storage tanks to serve the project. According to the General Plan EIR, no significant shortage in water supply is anticipated as a result of General Plan buildout. Development of the proposed project would be within the development levels considered by the General Plan EIR. The project will also be subject to the City's General Plan Policy 2.58.3 which requires the City to approve development plans only when a dependable and adequate water supply to serve the project is assured. The applicant will be required to obtain this assurance during the development review process.

IMPACTS AND MITIGATION:

With implementation of the City's standard and project specific conditions of approval, the proposed project is not anticipated to result in any potentially significant impacts to Utilities and Service Systems.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. AESTHETICS.				
Would the proposal:				
a. Affect a scenic vista or scenic highway? ^{1,4,5,6}	X			
b. Have a demonstrable negative aesthetic effect? ^{1,4,5,6}	X			
c. Create light or glare? ^{1,4,5,6}		X		

EXPLANATION:

XIII.a. Affect a scenic vista or scenic highway?

The project site is highly visible from surrounding streets, Lake Herman Road and Interstate 680. The segment of I-680 adjacent to the project site is not a designated State Scenic Highway. The project proposes extensive landform alterations and urban development within the Plan Area that would alter views of the project site from surrounding areas. An open space buffer, including the retention of existing hillsides in this buffer area, is proposed to the south of Lake Herman Road. The effects of the proposed project on views from key viewpoints identified through consultation with City staff will be assessed in the EIR.

XIII.b. Have a demonstrable negative aesthetic effect?

The EIR will evaluate the effects of proposed development, including grading and modifications to landform and features, on existing visual conditions and on key viewpoints. The proposed project will be assessed for change in landscape character, increases in light and glare and change in views during construction and operations. Potential visual impacts of the proposed change in use from land used for grazing to industrial and commercial use will be assessed in the EIR.

XIII.c. Create light or glare?

See response to XIII.b., above.

IMPACTS AND MITIGATION:

Impacts and mitigation measures necessary to reduce potentially significant impacts to visual resources will be identified in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. CULTURAL RESOURCES. Would the proposal:				
a. Disturb paleontological resources? ^{2.4.}		X		
b. Disturb archaeological resources? ^{2.4,10}		X		
c. Affect historical resources? ^{2.4,10}		X		
d. Have the potential to cause a physical change which would affect unique ethnic cultural values? ^{2.4,10}		X		
e. Restrict existing religious or sacred uses within the potential impact area? ^{2.4,10}				X

EXPLANATION:

XIV.a. Disturb paleontological resources?

Because the project site is not known to have been previously surveyed, the potential for uncovering buried paleontological, archaeological or cultural resources during excavation or grading does exist. An archaeological and historical resources records review and literature search through the Northwest Archaeological Information Center will be conducted for the EIR to determine whether previous surveys have been conducted and whether cultural resources exist within the study area boundary. The records search will be verified with a site visit. The results of the records search and site visit will be documented in the EIR on the Master Plan in the section that discusses effects found to be less than significant. However, if the records search is positive additional work may need to be performed for the EIR. The necessary analysis will be defined through consultation with City staff.

XIV.b. Disturb archaeological resources?

See response to XIV.a., above.

XIV.c. Affect historical resources?

Five structures are known to exist on the project site. These structures are associated with past agricultural and other use and are located in the western portion of the project site. The use of this and any other existing structure within the Plan Area will be determined as part of the evaluation of potential impacts to historic resources documented in the EIR. Also, see response to XIV.a. above.

XIV.d. Have the potential to cause a physical change which would affect unique ethnic cultural values?

See response to XIV.a., above.

XIV.e. Restrict existing religious or sacred uses within the potential impact area?

The site is currently used for grazing, and no religious or sacred uses take place on the project site.

IMPACTS AND MITIGATION:

Potential impacts to cultural resources will be discussed in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION. Would the proposal:				
a. Increase the demand for neighborhood or regional parks or other recreational facilities? ^{2,4,6}			X	
b. Affect existing recreational opportunities? ^{1,2,5,6,11}			X	

EXPLANATION:

XV.a. Increase the demand for neighborhood or regional parks or other recreational facilities?

The *Benicia General Plan* and the *Benicia Parks, Trails and Open Space Master Plan* set forth parks standards that call for 2.5 acres of community parks per 1,000 population and 3.5 acres of neighborhood parks per 1,000 people. The *Benicia Parks, Trails and Open Space Master Plan* identifies a citywide parks deficiency of approximately 35 acres of neighborhood park and 18 acres of community park through the year 2005. (The *Parks, Trails and Open Space Master Plan* identifies city-wide park land and recreation facility needs using a variety of analysis methods - see page 1-4.) The proposed project does not contain a residential component, and would therefore not lead to a direct increase in demand for neighborhood or community parks, or other recreational facilities. However, the project could result in an incremental increase in the weekday demand for City parks and recreational facilities resulting from the presence of new employees and visitors to the proposed industrial and commercial development. In addition, some percentage of future employees who do not currently reside within the City may choose to relocate to Benicia. However, at this time, the City does not maintain a park standard for commercial development based on employment levels.

The City has recently adopted the *Benicia Parks, Trails and Open Space Master Plan* which identifies additional sites for Neighborhood and Community parks. Additionally, the General Plan includes goals and related policies and programs to maintain and improve existing recreation programs. Because the proposed project is generally consistent with the General Plan, and because buildout of the development provided for in the General Plan is not expected to result in significant impacts to recreation resources, the proposed project would result in a less than significant impact. Impacts and opportunities for bicycle use on project roadways will be discussed in the Transportation section of the EIR.

XV.b. Affect existing recreational opportunities?

The proposed project site is located adjacent to Lake Herman Road, which leads to the Lake Herman open space area. Access to Lake Herman along Lake Herman Road would not be affected by project implementation. However, Lake Herman Road and Old Lake Herman Road (currently named Reservoir Road) are designated bike lanes in the *Benicia Parks, Trails and Open Space Master Plan*. Development of the project would result in the abandonment of Reservoir Road. The relationship of the proposed project to the *Parks, Trails and Open Space Master Plan* will be addressed in the Land use and Planning section of the EIR on the Master Plan.

IMPACTS AND MITIGATION:

Implementation of the proposed project is not anticipated to result in any potentially significant impacts to Recreational Opportunities in the vicinity of the site.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. MANDATORY FINDINGS OF SIGNIFICANCE.				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?				X
c. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)		X		
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

EXPLANATION:

XVI.a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

See responses to items I through XV.

XVI.b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?

Because a General Plan Amendment is not required as part of the proposed project, an analysis of short-term versus long-term effects is not required.

XVI.c. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)

See responses to items I through XV.

XVI.d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

See responses to items I through XV.

IMPACTS AND MITIGATION:

Impacts and mitigation for all potentially significant effects listed in items I through XV will be identified in the EIR.

Issues (and Supporting Information Sources):	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. EARLIER ANALYSES. (Not applicable to this project). ^a				X

^a An EIR was previously prepared for the project site in 1981. However, the project proposed at that time was significantly different from the currently proposed project, and the analysis contained therein is no longer applicable or accurate. Therefore, although this analysis and the analysis contained in the EIR will use the previously prepared EIR for background information, this EIR will not tier off the previously prepared EIR.

DETERMINATION

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION will be prepared.	
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	X
I find that the proposed project MAY have a significant effect(s) on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated". An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	
I find that although the proposed project could have a significant effect on the environment, there WILL NOT be a significant effect in this case because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project.	

Signature

Date

Printed Name

For

//forms/envIRON.chk//

	1. The first part of the report is a description of the project. It includes the title, the objectives, the scope, and the methodology. The title is 'The Effect of Temperature on the Rate of Reaction of Hydrogen Peroxide with Potassium Iodide'. The objectives are to determine the effect of temperature on the rate of reaction and to determine the activation energy of the reaction. The scope is to study the reaction at different temperatures. The methodology is to use a colorimetric method to measure the rate of reaction.												
	2. The second part of the report is a description of the results. It includes the data, the graphs, and the conclusions. The data is as follows: <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Rate of Reaction (s⁻¹)</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>0.0012</td> </tr> <tr> <td>30</td> <td>0.0025</td> </tr> <tr> <td>40</td> <td>0.0050</td> </tr> <tr> <td>50</td> <td>0.0100</td> </tr> <tr> <td>60</td> <td>0.0200</td> </tr> </tbody> </table> The graphs show the rate of reaction increasing with temperature. The conclusions are that the rate of reaction increases with temperature and that the activation energy of the reaction is 50 kJ mol⁻¹.	Temperature (°C)	Rate of Reaction (s ⁻¹)	20	0.0012	30	0.0025	40	0.0050	50	0.0100	60	0.0200
Temperature (°C)	Rate of Reaction (s ⁻¹)												
20	0.0012												
30	0.0025												
40	0.0050												
50	0.0100												
60	0.0200												
	3. The third part of the report is a discussion of the results. It includes the interpretation of the data, the evaluation of the experiment, and the conclusions. The interpretation of the data is that the rate of reaction increases with temperature. The evaluation of the experiment is that the experiment was carried out successfully and that the results are reliable. The conclusions are that the rate of reaction increases with temperature and that the activation energy of the reaction is 50 kJ mol⁻¹.												

APPENDIX B

NOP

■ ■ ■

March 30, 1999

**Re: Notice of Preparation of a Focused Environmental Impact Report for the
Proposed Benicia Business Park (PRJ 98-35)**

To Whom it May Concern:

This is to notify you that the City of Benicia has determined that a focused Environmental Impact Report (EIR) shall be prepared for the proposed Benicia Business Park. Your property is located within 300 feet of the proposed park.

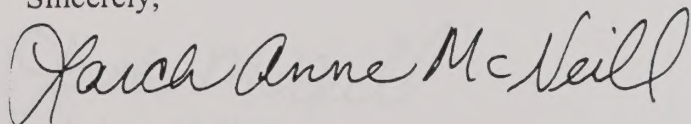
The 532 acre property which constitutes the project site is located within the Benicia city limits, south of Lake Herman Road, north of East Second Street and west of I-680 (APN's: 80-010-03, 11, 12; 80-030-06, 07, 10, 14, 16; 181-260-06 and 07). The City has determined that the current project may have significant impacts on the environment and has selected a consultant to prepare an initial study and subsequent focused EIR for the Benicia Business Park master plan and tentative map.

The applicant has requested the following actions:

1. Master Plan Overlay District Rezoning
2. Approval of a Master Plan
3. Approval of a Tentative Subdivision Map for 69 lots consistent with the existing zoning of limited industrial and general commercial.

Your response to this Notice, if you choose to respond, is due no later than April 30, 1999, in the City of Benicia Planning Department, 250 East L Street, Benicia, CA 94510. Responses to this Notice should be limited to potential impacts from development of the proposed Benicia Business Park, and will be considered in the preparation of the EIR. You will have the opportunity to comment on the draft EIR, and will be notified of all future public hearings for this project. You may contact the undersigned at (707) 746-4280 if you have any questions.

Sincerely,



Larch Anne McNeill
Associate Planner

LM/dr



sent 2/17/99

February 16, 1999

Bay Area Air Quality Management District
Attn: Henry Hilkin
939 Ellis Street
San Francisco, CA 94109

**Re: Notice of Preparation of a Focused Environmental Impact Report for the
Proposed Benicia Business Park**

To Whom it May Concern:

This is to notify you that the City of Benicia has determined that a focused Environmental Impact Report (EIR) shall be prepared for the proposed Benicia Business Park. The City has identified your agency as a potential Responsible Agency, or believes your agency may be interested in the project. Please review the following project description.

The 532 acre property which constitutes the project site is located within the Benicia city limits, south of Lake Herman Road, north of East Second Street and west of I-680. A previous EIR was prepared for the property in 1981. In 1983, the City Council certified the EIR and approved a land use amendment, rezoning and annexation for the site. LAFCO subsequently approved the annexation in 1985. The EIR prepared in 1981 was based on a conceptual plan for the site. While the general configuration of the conceptual plan was similar to the current proposed subdivision, the level of detail analyzed in the EIR was based on applications for a General Plan land use amendment and rezoning. No actual development plans were available for analysis. The City has determined that the current project may have significant impacts on the environment and has directed that a consultant be retained to prepare an initial study and subsequent focused EIR for the Benicia Business Park master plan and tentative map. No initial study has been prepared, but in discussions with the applicant, the following have been identified as potentially significant impacts:

- | | |
|-----------------------|------------------------------------|
| A. Visual impacts | D. Traffic and circulation impacts |
| B. Grading impacts | E. Public Health and Safety |
| C. Biological Impacts | |

The applicant has requested the following actions:

1. Master Plan Overlay District Rezoning
2. Approval of a Master Plan
3. Approval of a Tentative Subdivision Map for 69 lots consistent with the existing zoning of limited industrial and general commercial.

While all environmental issues will need to be addressed in the Focused EIR, the City has identified the following environmental issues as requiring the greatest attention:

- * **Grading Impacts** In order to develop the site for the uses allowed by the existing zoning, significant grading will be required. These issues were not addressed in detail in the 1981 Draft EIR as no grading plan was available at that time.
- * **Biological Impacts** The proposed project will involve the filling of several seasonal watercourses which flow through the project site.

The applicant has retained Sycamore Consultants in Lafayette to prepare a report, which includes:

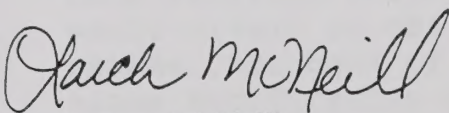
- A formal routine wetlands delineation in accordance with current US Army Corps of Engineers, California Department of Fish & Game and Regional Water Quality Control Board guidelines.
- A survey of potential rare plant and sensitive wildlife within the wetland areas.
- Identification of potential on-site mitigation sites.

- * **Traffic and Circulation Impacts** Development of the site may have significant impacts on the roadways in the project vicinity. These may include impacts to East Second Street, Lake Herman Road and three freeway interchanges.

- Lake Herman Road/I-680 interchange.
- East Second Street/I-780 interchange.
- Industrial Way/I-680 interchange, including the ramps at both Park Road and Bayshore Road.

Your response to this notice is due no later than March 17, 1999, in the City of Benicia Planning Department, 250 East L Street, Benicia, CA 94510. Please do not submit generalized comments unrelated to this project in response to this notice. You may contact the undersigned at (707) 746-4280 if you have any questions.

Sincerely,



Larch Anne McNeill
Associate Planner

LM/dr

(f:planning/dawn/letters/larch/buspark.lmc)



CITY OF VALLEJO

DEVELOPMENT SERVICES DEPARTMENT
Planning Division

555 SANTA CLARA STREET • P.O. BOX 3068 • VALLEJO • CALIFORNIA • 94590-5934 • (707) 648-4326
FAX (707) 552-0163

February 25, 1999

Larch Anne McNeill, Associate Planner
City of Benicia
Planning Department
250 East L Street
Benicia, CA 94510

- 1999

SUBJECT: FEIR - Proposed Benicia Business Park

Dear Ms. McNeill:

Thank you for sending us a copy of your Notice of Preparation for the subject Focused Environmental Impact Report.

Based upon the information that you sent us, we have only been able to identify two issues that we feel should be included in the study. Please have your consultants analyze:

1. the impacts on traffic at the intersection of Columbus Parkway and Lake Herman Road; and
2. the impacts on the bicycle route.

If you have any questions regarding this request, please give me a call.

Sincerely,

Richard L. Schneider
Senior Planner

DEPARTMENT OF FISH AND GAME

<http://www.dfg.ca.gov>

POST OFFICE BOX 47

YOUNTVILLE, CALIFORNIA 94599

(707) 944-5500



March 3, 1999

MAR 4 1999

Ms. Larch Anne McNeill
City of Benicia Planning Department
250 East L Street
Benicia, California 94510

Dear Ms. McNeill:

Benicia Business Park
Solano County

Department of Fish and Game personnel have reviewed the preliminary information provided for the preparation of a Draft Environmental Impact Report (EIR) for the Benicia Business Park. Under the biological impacts section, it is stated that the proposed project will involve the filling of several seasonal watercourses which flow through the project site. The Department is concerned about this proposal. In general, we are opposed to the filling of watercourses and the resultant loss of either existing or potential riparian habitat, as well as the disruption of wildlife movement corridors. The Department generally requests mitigation in situations where filling is permitted. Mitigation generally consists of creation of an equal length of stream, including setbacks with riparian vegetation, on the site to permit continued wildlife movement above and below the project site.

The Draft EIR should evaluate the significant impacts of filling existing watercourses. Avoidance should be evaluated and, if this is impractical, adequate mitigation proposed.

The Department has direct jurisdiction under Fish and Game Code sections 1601-03 in regard to any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any stream. We recommend early consultation since modification of the proposed project may be required to avoid impacts to fish and wildlife resources. To avoid unnecessary delays, formal notification under Fish and Game Code Section 1603 should be made after all other permits and certifications have been obtained. Work cannot be initiated until a streambed alteration agreement is executed.

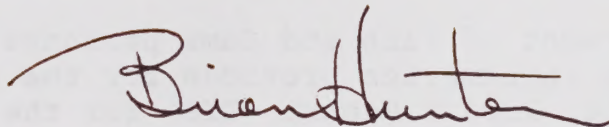
Conserving California's Wildlife Since 1870.

Ms. Larch Anne McNeill
March 3, 1999
Page Two

The U. S. Army Corps of Engineers (Corps) also has jurisdiction over the discharge of fill to streams and wetlands under Section 404 of the Clean Water Act. We recommend that the Corps be contacted to determine if they have jurisdiction and require a permit.

The necessary streambed alteration application forms may be obtained by contacting the Department at (707) 944-5520. If you have any questions concerning our comments, please contact Mr. Fred Botti, Associate Wildlife Biologist, at (707) 944-5534; or Mr. Carl Wilcox, Environmental Services Supervisor, at (707) 944-5525.

Sincerely,

A handwritten signature in dark ink, appearing to read "Brian Hunter". The signature is fluid and cursive, with a long horizontal stroke at the end.

Brian Hunter
Regional Manager
Central Coast Region

DEPARTMENT OF TRANSPORTATION

BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
TDD (510) 286-4454



March 16, 1999

SOL-680-R2.82
SOL680036

Planning Department
City of Benicia

MAR 18 1999

RECEIVED

Ms. Larch Anne McNeill
City of Benicia
City Hall
250 East L Street
Benicia, CA 94510

Dear Ms. McNeill:

Benicia Business Park

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for this project. We have the following comments regarding this project:

1. For your information, Caltrans plan to build a maintenance facility at 100 Industrial Way, at the southwest corner of the East Second Street intersection near your project site. The facility will provide routine and emergency response services for the Carquinez, Benicia/Martinez and Antioch Bridges.
2. We recommend that a complete traffic study be conducted for this project to determine the traffic and circulation impacts of the three (3) freeway interchanges noted in the "Notice of Preparation": the Lake Herman Road/I-680 interchange, the East Second Street/I-780 interchange, the Industrial Way/I-680 interchange and the ramps at Park Road and Bayshore Road. In addition, the traffic study should address the traffic impact of the East Second Street/Industrial Way and the East Second Street/Reservoir Road intersections. If the development will include the possible extension of West Industrial Way to Lake Herman Road, the traffic study should address the traffic and circulation impacts of this as well.
3. Please note that copies of all future project development plans and documents should be submitted to:

Ms. Jean Finney
Transportation Planning B, MS 8E
IGR/CEQA Branch
P O Box 23660
Oakland, CA 94623-0660

4. Any work or traffic control done within State right-of-way will require an encroachment permit. To apply for a Caltrans permit, the applicant should submit a completed application, environmental documentation and five sets of plans to the following address:

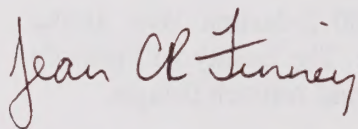
G. J. Battaglini, District Office Chief
Caltrans, District 4
Office of Permits
P.O. Box 23660
Oakland, CA 94623-0660

We appreciate the opportunity to work with you on this project. Should you require additional information or have any questions regarding this letter, please call Bonnit Braxton of my staff at (510) 622-1645.

Sincerely,

HARRY Y. YAHATA
District Director

By:



JEAN C. R. FINNEY
District Branch Chief
IGR/CEQA

c: State Clearinghouse

APPENDIX C

PLANT SURVEY



**RARE PLANT SURVEYS
OF UPLAND HABITATS
SEENO BENICIA INDUSTRIAL PARK PROJECT,
CITY OF BENICIA, SOLANO COUNTY, CALIFORNIA**

July 1, 1999

Prepared for:
Seecon Financial and Construction Company
4021 Port Chicago Highway
Concord, CA 94524-4113

Prepared by:
Sycamore Associates LLC
1220 Oakland Boulevard
Walnut Creek, CA 94696
(925) 279-0580

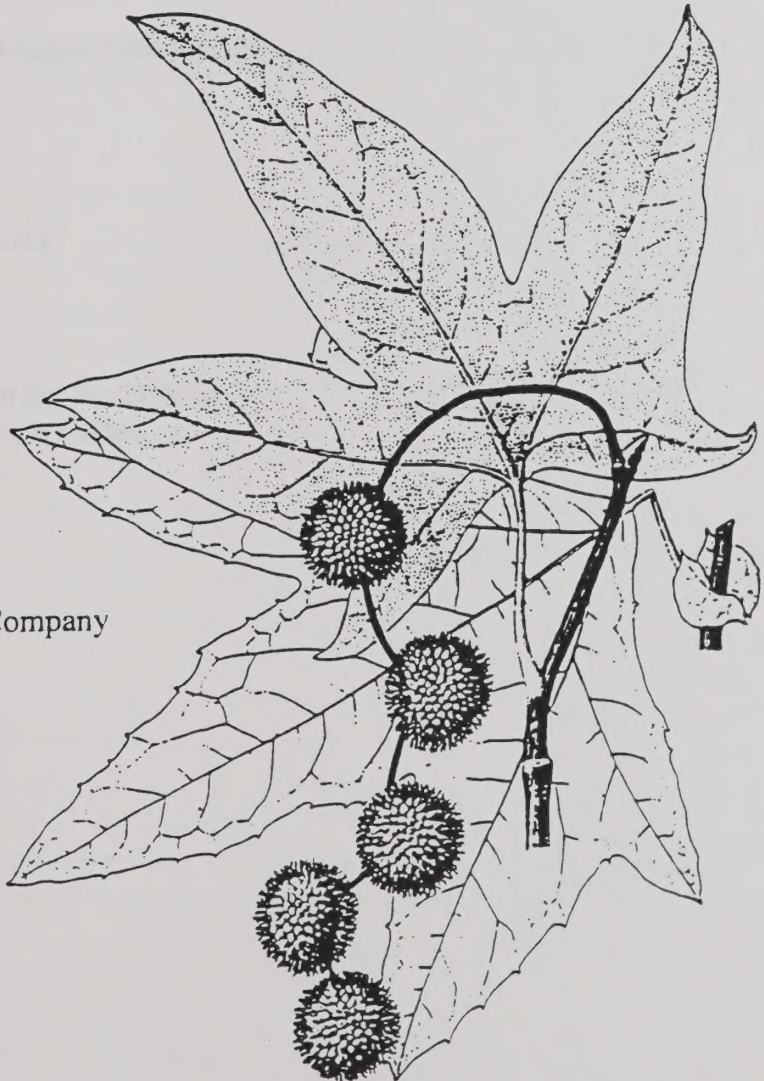


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SUMMARY

Focused special-status plant surveys were conducted in April, May and June, 1999 of the upland areas of the proposed Benicia Industrial Park site located on the outskirts of the City of Benicia, Solano County. The project site covers approximately 400 acres of low, rolling hills between Suisun Bay and Lake Herman. The property is bordered by industrial facilities and businesses to the south and extensive open space to the north. The City of Benicia's water treatment plant is situated near the middle of the property. Most of the property is currently used for livestock grazing.

Habitats on site consist primarily of non-native annual grassland. Portions of the site support small stands of eucalyptus woodland, scattered ornamental trees, and ruderal vegetation.

This report presents the results of our field investigations in upland areas for the early spring and late spring surveys; a late summer survey is pending, the results of which will be presented in a letter report that will serve as an addendum to this report.

The study area for the present surveys is restricted to the upland areas on the property. Focused surveys for special-status plant species in wetland areas on the property was conducted in 1997. Based on these surveys, no plant taxa regarded as significant under CEQA guidelines occur within wetland areas on site.

A total of 37 special-status plant species are known to occur in upland areas in the project region and were considered to have at least some potential to occur in the project vicinity. Based on focused surveys conducted during early spring and late spring of 1999, none of the target species have been detected on site. Fragrant fritillary and adobe lily might not have been detectable during the time of the present surveys, due to the early flowering habit of these two species and the fact that they do not bloom every year. However, these species have not been recorded from the Benicia area, and the potential for their occurrence on site is considered to be low due to the generally poor quality of the available grassland habitat. Eight target species are considered to have at least a low potential for occurrence due to the presence of marginally suitable habitat and the fact that they would not have been detectable during the present surveys. For this reason, summer-season surveys have been scheduled for late August 1999, when late flowering species would be identifiable in the field. The remaining twenty-seven target species are considered to have no potential for occurrence due to a lack of suitable habitat and/or the fact that they would have been detectable during the present surveys.

Based on the present field studies, no state- or federally-listed Endangered, Threatened or Rare plant species have been found within the study area. Similarly, no CNPS List 1B or List 2 species have been located. No plant taxa regarded as special-status species under CEQA guidelines have been detected. Although summer surveys are still pending, the potential for occurrence of any special-status plant species is considered to be low.

1.0 INTRODUCTION

The proposed Benicia Industrial Park study area is located adjacent to the City of Benicia in southwestern Solano County, California (Figure 1). The 400-acre study area overlooks Suisun Bay and is situated west of Highway 680, south of Lake Herman Road, east of Lake Herman and north of East Second Street. The property is divided by Reservoir Road.

Seeno Construction is proposing to develop the site for light industrial and business use. Sycamore Associates LLC was contracted to perform focused surveys for special-status plant species on the property. In 1997, focused surveys for special-status plant species were conducted in wetland areas of the site. The results of these surveys were presented in a separate report (Sycamore Associates 1997). In 1999, focused surveys were performed in the upland areas of the project site. This report presents the results of our field investigations in upland areas for the early spring and late spring surveys; a late summer survey is pending, the results of which will be presented in a letter report.

2.0 METHODS AND LIMITATIONS

The study area was surveyed by botanists Christopher Thayer and Dianne Lake of Sycamore Associates LLC on April 27, May 5, June 7, and June 8, 1999. All upland areas within the study area were surveyed on foot. Only upland areas were included in the present surveys; areas identified as wetland plant communities were not included as a part of this study.

During the present special-status plant surveys, all upland plant communities were visited and all plant species detected were identified and recorded (Appendix A). Survey methods conformed to California Department of Fish and Game's *Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities* (CDFG 1984). A final survey will be conducted in August, 1999; the results will be presented in a separate report.

Information on special-status plant species was compiled through a review of the California Natural Diversity Data Base (CDFG 1999a), the California Native Plant Society's (CNPS) *Electronic Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1999), the CDFG's *Special Plants List* (CDFG 1999b) and *Endangered, Threatened and Rare Plants of California* (CDFG 1999c), the U.S. Fish and Wildlife Service's *Endangered and Threatened Wildlife and Plants* (USFWS 1995), *Endangered and Threatened Plant and Animal Taxa; Proposed Rule* (USFWS 1996a) and *Federally Listed and Proposed Endangered and Threatened Plants of California* (USFWS 1996b).

Nomenclature used throughout this report conforms to Hickman (1993) for plants and Holland (1986) for plant communities; plant community names according to Sawyer and Keeler-Wolf

(1995) and Cowardin, *et al.* (1979) are also given where appropriate. Nomenclature for special-status plant species conforms to CDFG (1999b) and Skinner and Pavlik (1999).

3.0 EXISTING CONDITIONS

3.1 Setting

The study area covers approximately 400 acres of low, rolling hills overlooking Suisun Bay. The study area is bordered by an existing business park and light industry to the south and east. Extensive open space borders the site to the north and west. Lake Herman recreation area is located approximately one quarter mile to the west. The property surrounds the City of Benicia water treatment plant, which is situated near the middle of the property on the south side of Lake Herman Road. Reservoir Road divides the property into western and eastern portions. The only buildings onsite include an abandoned farm house, barn and related out-buildings located in the western portion of the site. The property is actively used for the grazing of livestock.

Topography consists of rolling hills, some with fairly steep slopes. Relatively level areas occur on the south west side of the site. Four drainages flow across the property, roughly from north to south. A single, prominent seep is present above Reservoir Road and several lesser seeps and swales are also present within the study area. The study area is situated approximately three-quarters of a mile northwest of the edge of Suisun Bay and two and a half miles from Carquinez Strait.

3.2 Plant Communities

Vegetation occurring within upland portions of the study area is dominated by non-native grassland. Some areas, particularly in the southern portion of the site, are dominated by ruderal vegetation, including dense stands of noxious weeds. Small stands of eucalyptus woodland are present south of Lake Herman Road in the central and western portions of the study area. These and a few scattered eucalyptus and other ornamental trees planted around the property represent the only woody vegetation on site. Within the study area, but outside of the scope of the present surveys, wetland areas support two special-status natural communities, generally along the low-lying valley bottoms and swales on the property. Discussion of these two plant communities, which include coastal/valley freshwater marsh and Central Coast riparian scrub, has been presented in separate reports (Sycamore Associates 1997a, 1997b).

Existing upland vegetation communities are described in more detail below.

Non-native Grassland

Non-native grassland is generally found in open areas in valleys and foothills throughout coastal and interior California (Holland 1986). It typically occurs on soils consisting of fine-textured loams or clays that are somewhat poorly drained. This vegetation type is dominated by non-native annual grasses and weedy annual and perennial forbs that have replaced native perennial grasslands and scrub as a result of human disturbance. Scattered native wildflower and grass species, representing

remnants of the original vegetation, may also be common. Non-native annual grassland on site conforms to the California annual grassland series as described in Sawyer and Keeler-Wolf (1995); it would be classified as upland following Cowardin, *et al.* (1979).

Within the study area, non-native grassland dominates over 95 percent of the study area. Dominant non-native grass species include Italian ryegrass (*Lolium multiflorum*), wild oats (*Avena spp.*), wild barleys (*Hordeum spp.*), bromes (*Bromus spp.*), and medusa-head grass (*Taeniatherum caput-medusae*), among others. Characteristic non-native forbs on site include filaree (*Erodium spp.*), rose clover (*Trifolium hirtum*), bellardia (*Bellardia trixago*), rough cat's ear (*Hypochaeris radicata*), hedge parsley (*Torilis nodosa*), bur-clover (*Medicago polymorpha*), and many others. The native grass species creeping wild-rye (*Leymus triticoides*) occurs in several places, especially in the northeast section. Small, sparse stands of native purple needlegrass (*Nassella pulchra*) are present at two locations. Native wildflowers detected include purple owl's-clover (*Castilleja exserta*), narrow-leaved mule ears (*Wyethia angustifolia*), blue-eyed-grass (*Sisyrinchium bellum*), Ithuriel's spear (*Triteleia laxa*), various lupines (*Lupinus spp.*), and hayfield tarweed (*Hemizonia congesta*) among others.

On site, portions of the grassland have become dominated by ruderal vegetation and highly invasive noxious weeds including such species as fennel (*Foeniculum vulgare*), purple star-thistle (*Centaurea calcitrapa*), yellow star-thistle (*Centaurea solstitialis*), artichoke thistle (*Cynara cardunculus*) and milk thistle (*Silybum marianum*).

Eucalyptus Woodland

This non-native plant community has become naturalized throughout coastal California since eucalyptus trees were first brought to the state in the late 1880s. Numerous species of the genus were imported for their horticultural interest and their potential utility as a fast-growing hardwood. Groves of eucalyptus were first planted in the vicinity of Berkeley and later planted in groves throughout the Central Coast and into southern California. Because climatic conditions in the western half of the state are very similar to the range of many of the imported species of eucalypts in Australia, the planted groves managed to persist and spread without cultivation. It is estimated that there are between 600 and 800 species of *Eucalyptus*, about 18 of which have become fairly widespread in California. The most common and widely grown species is Tasmanian blue gum (*Eucalyptus globulus*). Due to the fact that the so-called gum trees form dense, expanding groves, drop a tremendous amount of bark and leaf litter, and greatly alter the chemistry of the soil, eucalypts have contributed to the loss of native plant species which typically cannot persist in the understory. Eucalypts have had an especially adverse effect on the native coastal scrub and coast grassland communities. Eucalyptus woodland on site conforms to the eucalyptus series as described in Sawyer and Keeler-Wolf (1995); it would be classified as upland following Cowardin, *et al.* (1979).

Within the study area, eucalyptus woodland is dominated by Tasmanian blue gum trees 60-80 feet in height and around 50 years in age. Because these trees provide the only shade available for grazing livestock, the understory has been completely trampled and is dominated by a very sparse understory of invasive, non-native herbaceous species such as Italian thistle (*Carduus*

pycnocephalus), milk thistle (*Silybum marianum*), horehound (*Marrubium vulgare*), cheeseweed (*Malva parviflora*) and dwarf nettle (*Urtica urens*).

3.3 Special-Status Plant Species

Special-status plant species include those listed as endangered, threatened, rare, or as candidates for listing by the USFWS (1995, 1996a, b), the CDFG (1999a, b,c), and the California Native Plant Society (CNPS) (Skinner and Pavlik 1999). The CNPS listing is sanctioned by the CDFG and serves essentially as their list of "candidate" plant species.

Based on a review special-status plant species in Solano County (CDFG 1999a; Skinner and Pavlik 1999), a total of 37 special-status plant species were determined to have some potential for occurring in upland habitats within the project region. Based on early and late spring focused surveys, none of these target species were detected on site. Fragrant fritillary (*Fritillaria liliacea*) and adobe lily (*Fritillaria pluriflora*) might not have been detectable during the time of the present surveys, due to the early flowering habit of these two species and the fact that they do not bloom every year. However, these species have not been recorded from the Benicia area, and the potential for their occurrence on site is considered to be low due to the generally poor quality of the available grassland habitat. Eight species, including Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*), big tarweed (*Blepharizonia plumosa* ssp. *plumosa*), Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*), heartscale (*Atriplex cordulata*), brittlescale (*Atriplex depressa*), San Joaquin spearscale (*Atriplex joaquiniana*), crownscale (*Atriplex coronata* var. *coronata*), and soft bird's-beak (*Cordylanthus mollis* ssp. *hispidus*) would probably not have been detectable during the present surveys, based on the fact that they typically begin to bloom later in the season. For this reason, a summer-season survey has been scheduled for late August 1999, when these species would be identifiable in the field. The remaining twenty-seven taxa are considered to have no potential for occurrence on site due to a lack of suitable habitat and/or the fact that they would have been detectable during the present surveys.

A summary of the status, habitat affinities, reported localities in the project area, blooming period, and potential for occurrence on site for each of the target plant species is presented in Table 1. An explanation of all sensitivity status codes is provided in Appendix B.

3.4 Special-Status Natural Communities

Special-status natural communities are those which are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (*i.e.*, §404 of the Clean Water Act and/or the CDFG §§1600 *et seq.* of the California Fish and Game Code). In addition, the CNDDB has designated a number of communities as rare; these communities are given the highest inventory priority (Holland, 1986; CDFG, 1990).

Upland portions of the study area consist primarily of non-native annual grassland, some ruderal vegetation, and a small area of eucalyptus woodland. Upland portions of the study area do not support any special-status natural communities. The only special-status plant communities occurring on site include coastal/valley freshwater marsh and Central Coast riparian scrub. A

discussion of these habitats is provided in separate reports (Sycamore Associates 1997a,b).

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on two focused botanical surveys, no state- or federally-listed Endangered, Threatened or Rare plant species were detected within the upland areas of the study area. Similarly, no CNPS List 1B or List 2 species were located. No plant taxa regarded as significant under CEQA guidelines have been found to occur on site.

A final survey will be conducted in August for species that would not have been in bloom or detectable at the time of the three spring surveys. The results of the summer-season focused plant surveys will be presented in a letter report that will serve as an addendum to this report.

Two focused surveys of wetland habitats within the study area were conducted during 1997 (Sycamore Associates 1997). Based on these surveys, no state- or federally-listed Endangered, Rare or Threatened plant species were found within wetlands in the study area and none are expected. Similarly, no CNPS List 1B or List 2 species were located and none are expected. No plant taxa regarded as significant under CEQA guidelines occur in wetland habitats on site.

Two special-status plant communities present on site include coastal/valley freshwater marsh and Central Coast riparian scrub. The significance of these habitats is discussed in a separate report.

TABLE 1

**POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES
in UPLAND AREAS of the
SEENO BENICIA INDUSTRIAL PARK PROJECT SITE**

Family Scientific Name Common Name	Status ¹	Habitat Affinities and Reported Localities in the Project Area	Blooming Period/ Life Form	Potential for Occurrence Onsite
Apiaceae				
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i> Gairdner's yampah	Federal SC State CEQA? CNPS 4:1-2-3	Mesic sites in broadleafed upland forest, chaparral, coastal prairie, Valley/foothill grassland, vernal pools. Found from the Bay Area and San Joaquin Valley to the Oregon border. Endangered in the southern portion of its range.	June-Oct Perennial herb	Low: marginally suitable habitat present onsite. Might not have been detectable.
Asteraceae				
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> big-scale balsamroot	Federal none State CEQA CNPS 1B:2-2-3	Cismontane woodland, Valley/foothill grassland, sometimes on serpentinite. Occurs from the Bay Area to the northern Sacramento Valley and Sierra foothills.	March-June Perennial herb	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Erigeron biolettii</i> streamside daisy	Federal none State CEQA? CNPS 3:?-2-3	Broadleafed upland forest, cismontane woodland, North Coast coniferous forest, on rocky, mesic sites. Found from Humboldt County to the northern San Francisco Bay Area.	June-Sept Perennial herb	None: no suitable habitat present onsite.
<i>Helianthella castanea</i> Diablo helianthella	Federal SC State CEQA CNPS 1B:3-2-3	Broadleaf upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and Valley/foothill grassland. Occurs in Alameda, Contra Costa and San Mateo counties; presumed extirpated in Marin and San Francisco counties.	April-June Perennial herb	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Hemizonia parryi</i> ssp. <i>congdonii</i> Congdon's tarplant	Federal SC State CEQA CNPS 1B:3-3-3	Valley/foothill grasslands on alkaline soils. Restricted to San Luis Obispo, Monterey, and possibly Santa Clara counties; presumed extirpated in Alameda, Contra Costa, Santa Cruz and Solano counties.	June-Nov Annual herb	Low: marginally suitable habitat present onsite. Might not have been detectable.
<i>Isocoma arguta</i> Carquinez goldenbush	Federal SC State CEQA CNPS 1B:3-3-3	Valley/foothill grasslands, on alkaline sites. Restricted to Contra Costa and Solano counties in the vicinity of the Carquinez Straits.	Aug-Dec Perennial shrub	None: marginally suitable habitat present onsite. Would have been detectable.

TABLE 1 (continued)

<i>Lasthenia conjugens</i> Contra Costa goldfields	Federal State CNPS	FE CEQA 1B:3-3-3	Mesic sites in Valley/foothill grassland, vernal pools. Restricted to Napa and Solano counties; presumed extirpated in Alameda, Contra Costa, Mendocino, Santa Barbara and Santa Clara counties.	Mar-June Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Lessingia hololeuca</i> woolly-headed lessingia	Federal State CNPS	none CEQA? 3:2-2-3	Coastal scrub, Valley/foothill grasslands on clay and serpentinite. Found from Monterey to Napa counties.	June-Oct Annual herb	None: no suitable habitat present onsite. Would have been detectable.
<i>Psilocarphus brevissimus</i> var. <i>multiflorus</i> Delta woolly-marbles	Federal State CNPS	none CEQA? 4:1-2-3	Vernal pools. Recorded from Alameda, Napa, Santa Clara, San Joaquin, Solano, Stanislaus and Yolo counties.	May-June Annual herb	None: no suitable habitat present onsite. Would have been detectable.
<i>Senecio aphanactis</i> rayless ragwort	Federal State CNPS	none CEQA 2:3-2-1	Coastal scrub and cismontane woodland on alkaline soils. Known from the South Coast, Central Coast, Central Valley and San Francisco Bay.	Jan-April Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Boraginaceae					
<i>Plagiobothrys hystriculus</i> bearded popcorn-flower	Federal State CNPS	none CEQA 1A	Vernal pools and mesic Valley/foothill grassland. Presumed extinct. Endemic to Solano County.	April-May Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Campanulaceae					
<i>Downingia pusilla</i> dwarf downingia	Federal State CNPS	none CEQA 2:1-2-1	Mesic sites in Valley/foothill grassland and vernal pools. Occurs from Sonoma and Napa counties through the Sacramento Valley and Sierra foothills.	Mar-May Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Legenere limosa</i> legenere	Federal State CNPS	SC CEQA 1B:2-3-3	Vernal pools. Recorded from Lake and Napa counties throughout the Sacramento Valley. Believed extirpated in Sonoma and Stanislaus counties.	May-June Annual herb	None: no suitable habitat present onsite.
Chenopodiaceae					
<i>Atriplex cordulata</i> heartscale	Federal State CNPS	SC CEQA 1B:2-2-3	Chenopod scrub, Valley/foothill grassland, on somewhat alkaline or saline hard packed soils. Recorded from Alameda County throughout the Central Valley from Glenn to Kern counties. Presumed extirpated in Contra Costa and San Joaquin counties.	May-Oct Annual herb	Low: marginally suitable habitat present onsite. Might not have been detectable.
<i>Atriplex coronata</i> var. <i>coronata</i> crownscale	Federal State CNPS	none CEQA? 4:1-2-3	Chenopod scrub, Valley/foothill grassland on alkaline soils. Known from the northern San Joaquin Valley, Central Coast, and eastern San Francisco Bay.	Apr-Oct Annual herb	Low: marginally suitable habitat present onsite. Might not have been detectable.

TABLE 1 (continued)

<i>Atriplex depressa</i> brittlescale	Federal State CNPS	none CEQA 1B:2-2-3	Chenopod scrub, playas and Valley/foothill grassland on alkaline and clay soils. Occurs from Solano County throughout the Sacramento and San Joaquin Valleys. Presumed extirpated in Stanislaus County.	May-Oct Annual herb	Low: marginally suitable habitat present onsite. Might not have been detectable.
<i>Atriplex joaquiniana</i> San Joaquin spearscale	Federal State CNPS	SC CEQA 1B:2-2-3	Chenopod scrub, Valley/foothill grassland and alkali meadows. Occurs from Solano County throughout the Sacramento and San Joaquin valleys. Presumed extirpated in Santa Clara, San Joaquin and Tulare counties.	April-Sept Annual herb	Low: marginally suitable habitat present onsite. Might not have been detectable.
Fabaceae					
<i>Astragalus tener</i> var. <i>ferrisiae</i> alkali milk-vetch	Federal State CNPS	SC CEQA 1B:3-3-3	Vernally mesic meadows, Valley/foothill grasslands on sub-alkaline flats. Extant in Butte County; presumed extirpated in Solano, Colusa and Yolo counties.	April-May Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Astragalus tener</i> var. <i>tener</i> alkali milk-vetch	Federal State CNPS	none CEQA 1B:3-2-3	Playas, Valley/foothill grasslands, on adobe clay and alkaline vernal pools. Extant in Merced, Solano and Yolo counties. Extirpated throughout the Bay Area and San Joaquin Valley.	March-June Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Trifolium amoenum</i> showy indian clover	Federal State CNPS	FE CEQA 1B:3-3-3	Valley/foothill grasslands, in sunny open sites, sometimes on serpentinite. Rediscovered in Sonoma County in 1993, believed extirpated in Alameda, Mendocino, Marin, Napa, Santa Clara and Solano counties.	April-June Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Grossulariaceae					
<i>Ribes victoris</i> Victor's gooseberry	Federal State CNPS	none CEQA? 4:1-1-3	Mixed evergreen forest, redwood forest, and chaparral in canyons. Known from Mendocino, Marin, Napa, Solano and Sonoma counties.	Mar-April Deciduous shrub	None: no suitable habitat present onsite.
Juglandaceae					
<i>Juglans californica</i> var. <i>hindsii</i> Northern California black walnut	Federal State CNPS	SC CEQA 1B:3-3-3	Riparian forests and riparian woodlands. Known from only two extant populations in Napa and Contra Costa counties. Presumed extirpated in Sacramento, Solano and Yolo counties. Widely naturalized in cismontane Calif., used as a root stock for <i>J. regia</i> .	April-May Deciduous tree	None: no suitable habitat present onsite.
Lamiaceae					
<i>Monardella villosa</i> ssp. <i>globosa</i> robust monardella	Federal State CNPS	none CEQA 1B:3-2-3	Openings in chaparral, cismontane woodland. Occurs from the San Francisco Bay Area to Humboldt County.	June-July Perennial herb (rhizotomous)	None: marginally suitable habitat present onsite. Would have been detectable.

TABLE 1 (continued)

<i>Monardella viridis</i> ssp. <i>viridis</i> green monardella	Federal State CNPS	none CEQA? 4:1-1-3	Broadleaf upland forest, chaparral and cismontane woodland. Known from Lake, Napa, Solano and Sonoma counties.	July-Sept. Perennial herb (rhizomatous)	None: marginally suitable habitat present onsite. Would have been detectable.
Liliaceae					
<i>Calochortus pulchellus</i> Mt. Diablo fairy-lantern	Federal State CNPS	none CEQA 1B:2-2-3	Chaparral, cismontane woodland, Valley/foothill grassland. Known from Contra Costa and possibly Solano counties.	April-June Perennial herb (bulbiferous)	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Fritillaria liliacea</i> fragrant fritillary	Federal State CNPS	SC CEQA 1B:1-2-3	Coastal prairie, coastal scrub, Valley/foothill grassland near the coast, on clay or serpentinite. Known from throughout the Central Coast from Sonoma to Monterey counties and the San Francisco Bay Area.	Feb-April Perennial herb (bulbiferous)	Low: marginally suitable habitat present onsite. Might not have been detectable.
<i>Fritillaria pluriflora</i> adobe lily	Federal State CNPS	SC CEQA 1B:1-2-3	Chaparral, cismontane woodland, Valley/foothill grassland, often on adobe soils. Recorded from throughout the northern Sacramento Valley to Napa.	Feb-April (bulbiferous)	Low: marginally suitable habitat present onsite. Might not have been detectable.
Linaceae					
<i>Hesperolinon breweri</i> Brewer's dwarf flax	Federal State CNPS	SC CEQA 1B:2-2-3	Chaparral, cismontane woodlands, Valley/foothill grassland, mostly on serpentinite. Found in Napa, Solano, and Contra Costa counties.	May-July Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Poaceae					
<i>Neostafa colusana</i> Colusa grass	Federal State CNPS	FT CE 1B:1-3-3	Restricted to large, northern claypan vernal pools with alkaline soils that remain flooded until early summer. Known from Merced, Solano Stanislaus and Yolo counties; presumed extirpated in Colusa County.	May-July Annual herb	None: no suitable habitat present onsite.
<i>Tuctoria mucronata</i> Crampton's tuctoria	Federal State CNPS	FE CE 1B:3-3-3	Restricted to vernal pools. Known from only three occurrences near Jepson Prairie and Davis. Reported in Solano and Yolo counties.	April-July Annual herb	None: no suitable habitat present onsite.
Polemoniaceae					
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia	Federal State CNPS	none CEQA 1B:2-2-3	Cismontane woodland, lower montane coniferous forest, mesic meadows, Valley/foothill grassland, vernal pools. Known from Tehama, Colusa, Lake, Mendocino, Solano, Sonoma, Santa Clara, Marin, and Napa counties.	May-July Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Polygonaceae					
<i>Eriogonum truncatum</i> Mt. Diablo buckwheat	Federal State CNPS	none CEQA 1A	Chaparral, coastal scrub, Valley/foothill grassland on sandy soils. Presumed extinct. Known historically from Alameda, Contra Costa and Solano counties. Last seen in 1940.	April-Sept Annual herb	None: no suitable habitat present onsite.

TABLE 1 (continued)

Ranunculaceae					
<i>Delphinium recurvatum</i> recurved larkspur	Federal State CNPS	SC CEQA 1B:1-2-3	Chenopod scrub, cismontane woodland and Valley/ foothill grassland in alkaline places. Restricted to the Central Valley from Colusa to Kern counties, San Luis Obispo.	Mar-May Perennial herb	None: marginally suitable habitat present onsite. Would have been detectable.
<i>Ranunculus lobbii</i> Lobb's aquatic buttercup	Federal State CNPS	none CEQA? 4:1-2-3	Mesic sites in cismontane woodland, Valley/foothill grassland, North Coast coniferous forest and vernal pools. Known from the San Francisco Bay Area to Mendocino and Napa counties.	March-May Annual herb (aquatic)	None: marginally suitable habitat present. Would have been detectable.
Scrophulariaceae					
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i> soft bird's-beak	Federal State CNPS	SC CEQA 1B:2-3-3	Meadows, playas, Valley/foothill grassland on alkaline sites. Recorded from Alameda, Kern, Merced, Placer and Solano counties.	June-Sept Annual herb (hemiparasite)	Low: marginally suitable habitat present onsite. Might not have been detectable.
Thymelaeaceae					
<i>Dirca occidentalis</i> western leatherwood	Federal State CNPS	none CEQA 1B:2-2-3	Broadleaf upland forest, closed cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland. Restricted to brushy slopes and mesic sites. Known from San Mateo to Sonoma counties.	Jan-April Deciduous Shrub	None: no suitable habitat present. Would have been detectable.

¹ Explanation of sensitivity status codes provided in Appendix B.

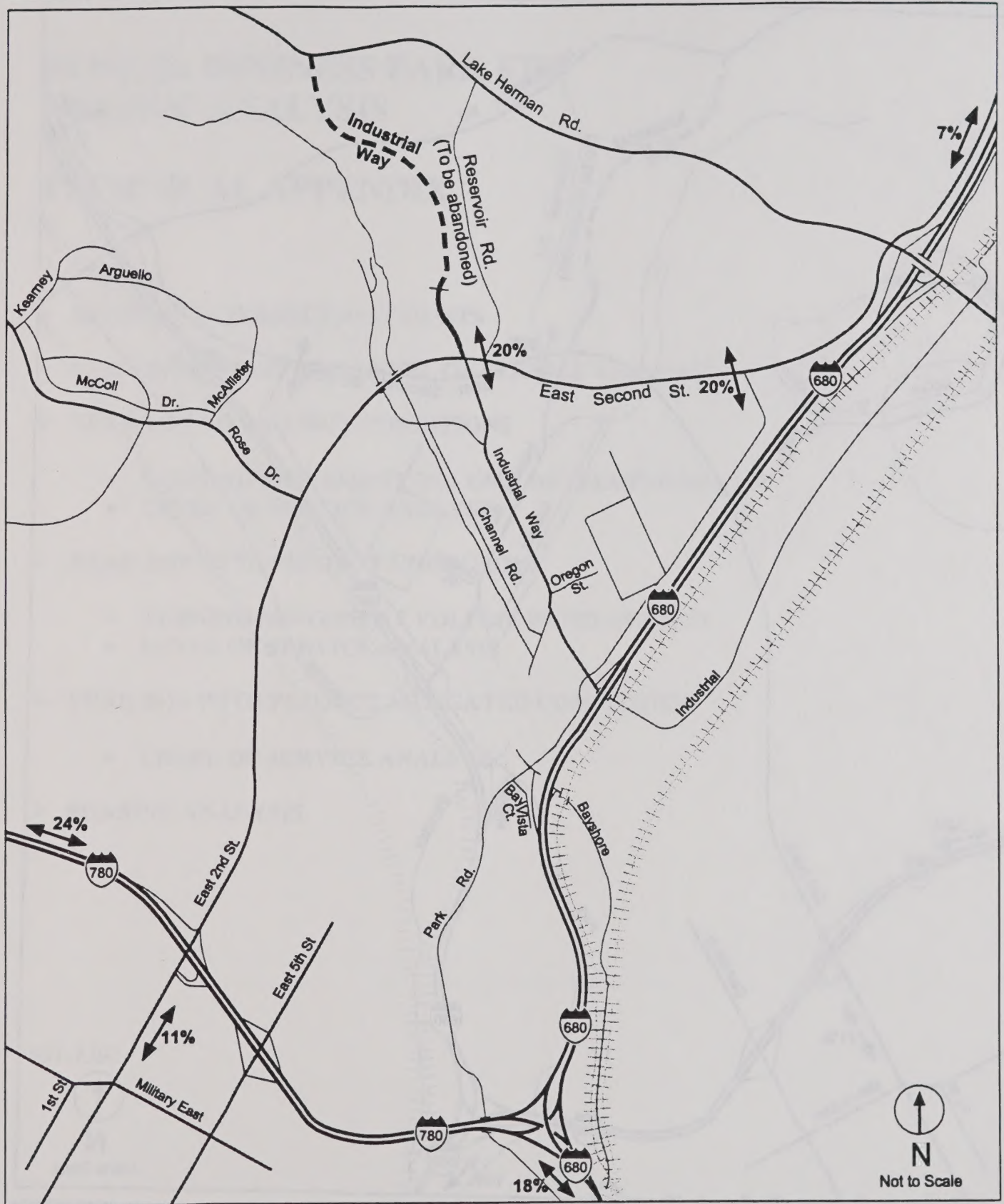
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APPENDIX D

TRAFFIC TECHNICAL APPENDIX



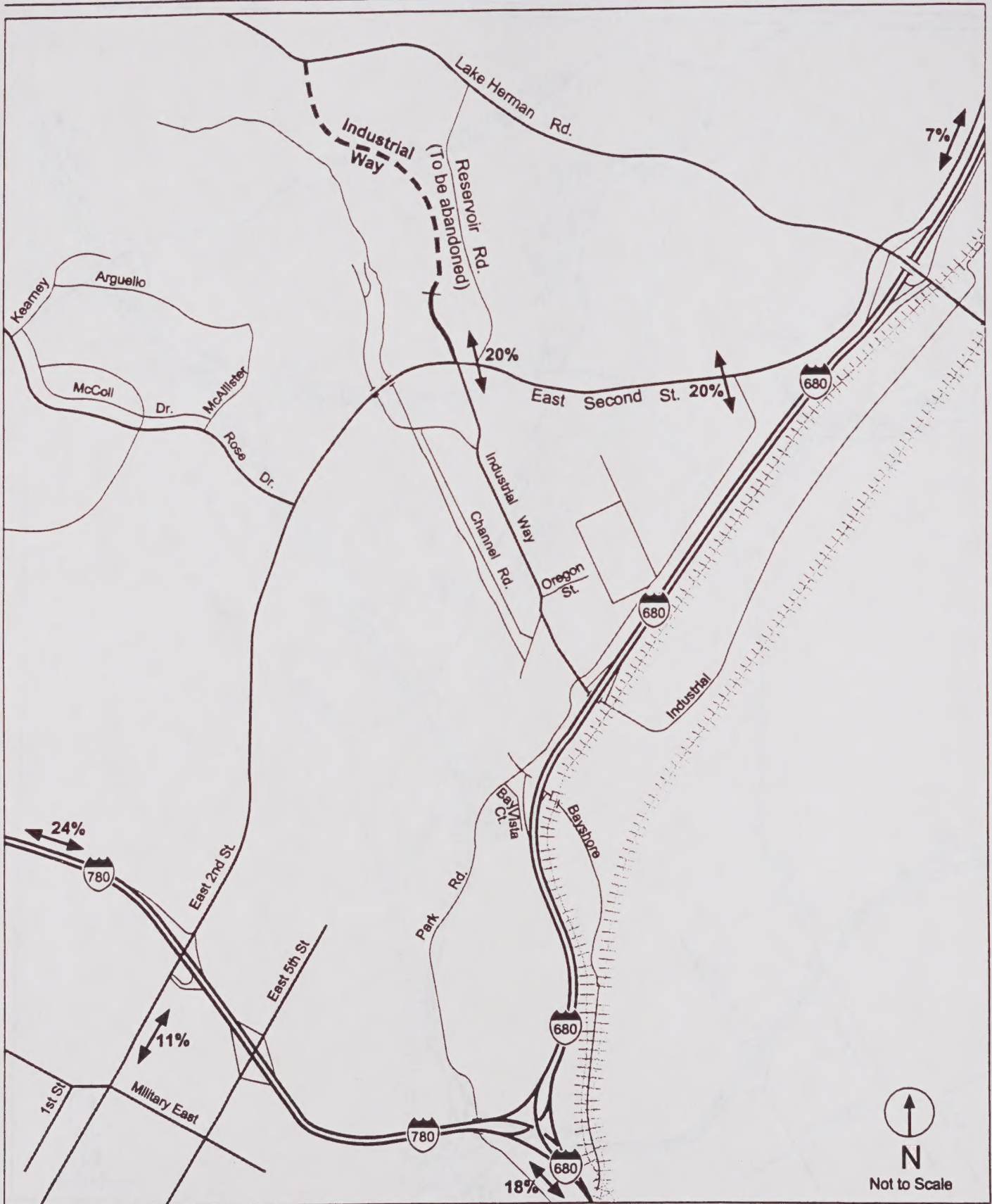


Appendix

TRIP DISTRIBUTION FOR TOURTELOT RESIDENTIAL PROJECT



1392-01d



Appendix

TRIP DISTRIBUTION FOR TOURTELOT
RESIDENTIAL PROJECT



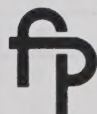
1392-01d

BENICIA BUSINESS PARK EIR TRAFFIC ANALYSIS

TECHNICAL APPENDIX

- **EXISTING INTERSECTION COUNTS**
- **EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS**
- **YEAR 2010 NO PROJECT CONDITIONS**
 - **TURNING MOVEMENT VOLUME DEVELOPMENT**
 - **LEVEL OF SERVICE ANALYSIS**
- **YEAR 2010 WITH PROJECT CONDITIONS**
 - **TURNING MOVEMENT VOLUME DEVELOPMENT**
 - **LEVEL OF SERVICE ANALYSIS**
- **YEAR 2010 WITH PROJECT MITIGATED CONDITIONS**
 - **LEVEL OF SERVICE ANALYSIS**
- **PHASING ANALYSIS**

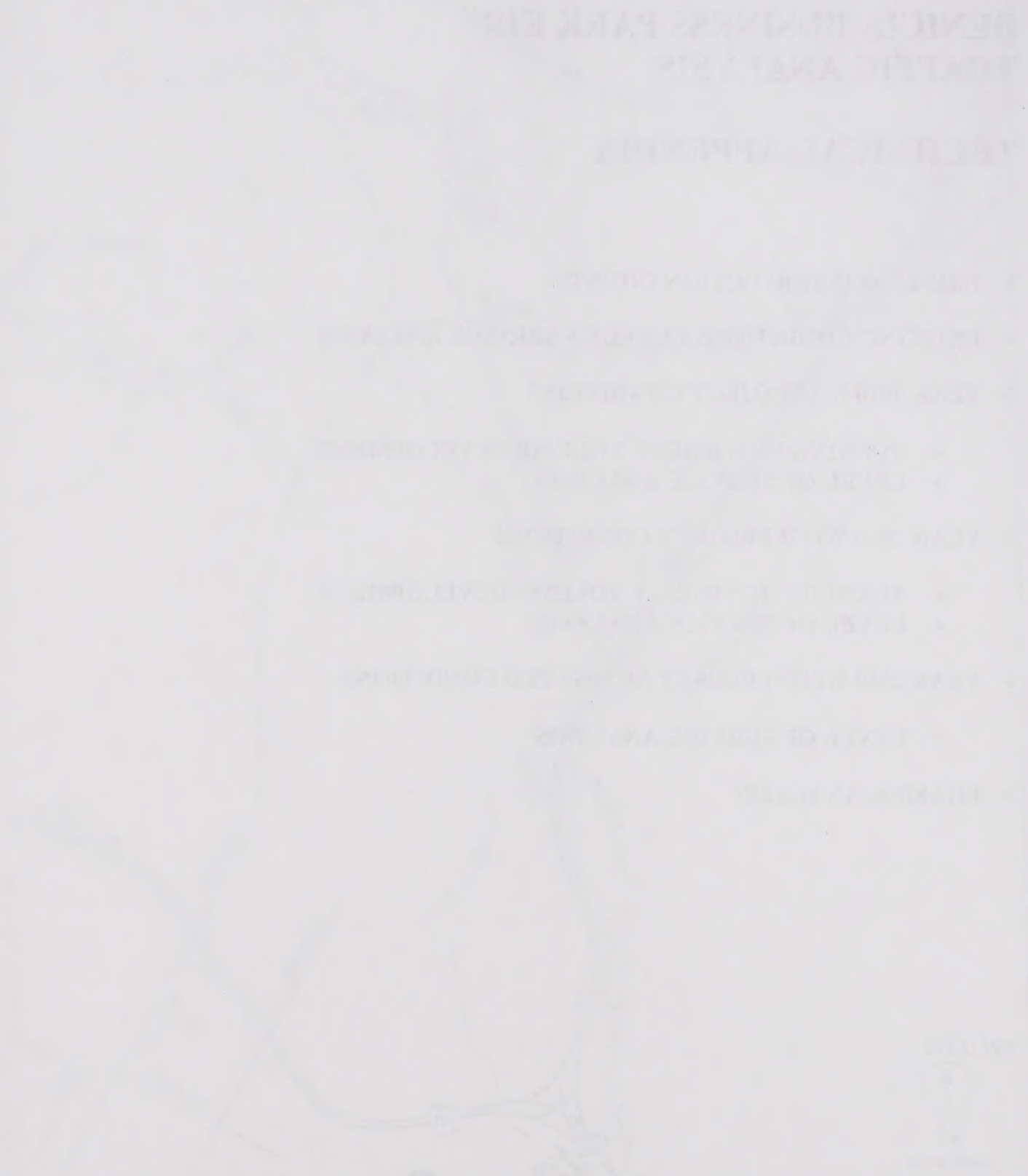
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Fehr & Peers Associates
Transportation Consultants

3685 Mt Diablo Blvd
Suite 301
Lafayette, CA 94549
925 284-3200
FAX 925 284-2691

EXISTING INTERSECTION COUNTS



Fort & Port Authority 1000 Fort Street Fort & Port Authority 1000 Fort Street Fort & Port Authority 1000 Fort Street	INSTRUCTIONS FOR PREPARATION OF EXISTING INTERSECTION COUNTS 1. The intersection counts should be taken at the following locations: a. All intersections of the project with existing roads. b. All intersections of the project with existing roads. c. All intersections of the project with existing roads.	10
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BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT: BENICIA TMC SURVEY DATE: 5/19/99 DAY: WEDNESDAY
 N-S Approach: E. 2ND STREET SURVEY TIME: 7:00 AM TO 9:00 AM
 E-W Approach: I-780 EB RAMP CITY: BENICIA FILE NAME: SAM

PEAK HOUR
 07:30 AM TO 08:30 AM

ARRIVAL/DEPARTURE VOLUMES

North

PHF= 0.82

566 583

PHF= 0.93

PHF= ERR

487 438

PHF= 0.85

I-780 EB RAMP

E. 2ND STREET

TIME PERIOD		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	

SURVEY DATA

07:00 AM	---	07:15 AM	0	51	31	55	70	0	0	0	0	40	0	40	287
07:15 AM	---	07:30 AM	0	112	69	129	124	0	0	0	0	76	0	92	602
07:30 AM	---	07:45 AM	0	175	114	197	194	0	0	0	0	127	0	164	971
07:45 AM	---	08:00 AM	0	247	147	274	290	0	0	0	0	182	0	230	1,370
08:00 AM	---	08:15 AM	0	335	173	340	354	0	0	0	0	225	0	303	1,730
08:15 AM	---	08:30 AM	0	424	195	393	426	0	0	0	0	261	0	363	2,062
08:30 AM	---	08:45 AM	0	523	225	441	480	0	0	0	0	301	0	413	2,383
08:45 AM	---	09:00 AM	0	610	250	478	544	0	0	0	0	335	0	451	2,668

TOTAL BY PERIOD

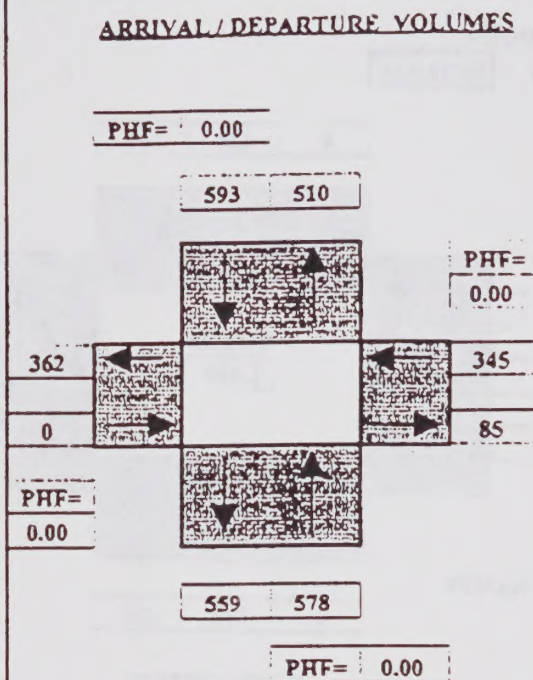
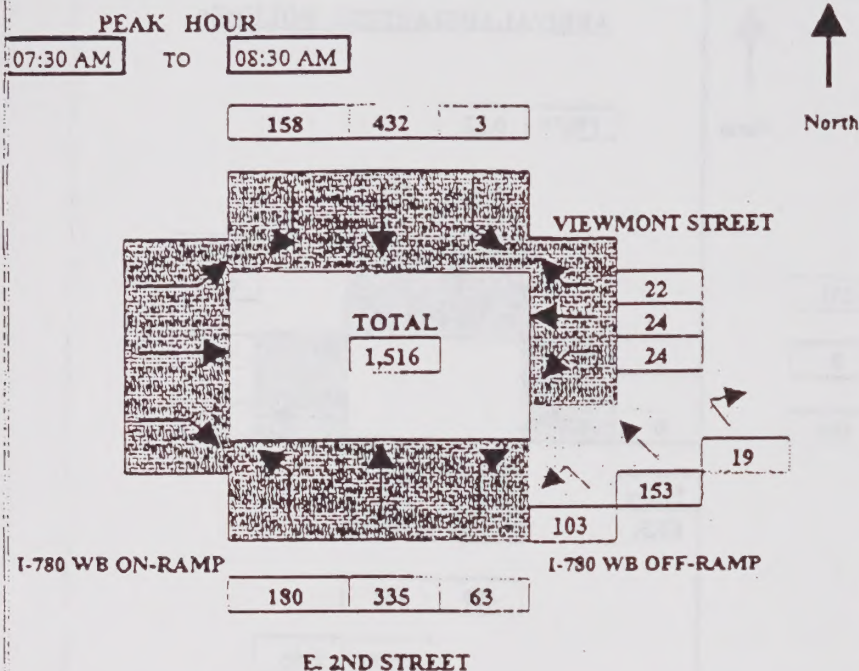
07:00 AM	---	07:15 AM	0	51	31	55	70	0	0	0	0	40	0	40	287
07:15 AM	---	07:30 AM	0	61	38	74	54	0	0	0	0	36	0	52	315
07:30 AM	---	07:45 AM	0	63	45	68	70	0	0	0	0	51	0	72	369
07:45 AM	---	08:00 AM	0	72	33	77	96	0	0	0	0	55	0	66	399
08:00 AM	---	08:15 AM	0	88	26	66	64	0	0	0	0	43	0	73	360
08:15 AM	---	08:30 AM	0	89	22	53	72	0	0	0	0	36	0	60	332
08:30 AM	---	08:45 AM	0	99	30	48	54	0	0	0	0	40	0	50	321
08:45 AM	---	09:00 AM	0	87	25	37	64	0	0	0	0	34	0	38	285

HOURLY TOTALS

07:00 AM	---	08:00 AM	0	247	147	274	290	0	0	0	0	182	0	230	1,370
07:15 AM	---	08:15 AM	0	284	142	285	284	0	0	0	0	185	0	263	1,443
07:30 AM	---	08:30 AM	0	312	126	264	302	0	0	0	0	185	0	271	1,460
07:45 AM	---	08:45 AM	0	348	111	244	286	0	0	0	0	174	0	249	1,412
08:00 AM	---	09:00 AM	0	363	103	204	254	0	0	0	0	153	0	221	1,298

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT:	BENICIA TMC	SURVEY DATE:	5/19/99	DAY:	WEDNESDAY
N-S Approach:	E. 2ND STREET	SURVEY TIME:	7:00 AM TO 9:00 AM		
E-W Approach:	I-780 WB RAMPS - VIEWMONT STREET	CITY:	BENICIA	FILE NAME:	6AM



TIME PERIOD		NORTHBOUND			SOUTHBOUND			I-780 WB RAMPS			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	

SURVEY DATA															
07:00 AM	---	07:15 AM	34	58	2	0	97	23	24	42	0	8	0	3	291
07:15 AM	---	07:30 AM	75	125	9	0	201	53	43	80	1	12	2	5	606
07:30 AM	---	07:45 AM	128	192	15	2	304	96	73	125	4	22	5	10	976
07:45 AM	---	08:00 AM	175	278	30	2	441	141	99	166	10	28	12	14	1,396
08:00 AM	---	08:15 AM	213	372	49	3	543	179	121	203	16	33	20	21	1,773
08:15 AM	---	08:30 AM	255	460	72	3	633	211	146	233	20	36	26	27	2,122
08:30 AM	---	08:45 AM	290	553	86	5	715	238	164	259	27	40	33	30	2,440
08:45 AM	---	09:00 AM	338	634	95	5	803	263	179	291	33	45	37	35	2,758

TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	34	58	2	0	97	23	24	42	0	8	0	3	291
07:15 AM	---	07:30 AM	41	67	7	0	104	30	19	38	1	4	2	2	315
07:30 AM	---	07:45 AM	53	67	6	2	103	43	30	45	3	10	3	5	370
07:45 AM	---	08:00 AM	47	86	15	0	137	45	26	41	6	6	7	4	420
08:00 AM	---	08:15 AM	38	94	19	1	102	38	22	37	6	5	8	7	377
08:15 AM	---	08:30 AM	42	88	23	0	90	32	25	30	4	3	6	6	349
08:30 AM	---	08:45 AM	35	93	14	2	82	27	18	26	7	4	7	3	318
08:45 AM	---	09:00 AM	48	81	9	0	88	25	15	32	6	5	4	5	318

HOURLY TOTALS															
07:00 AM	---	08:00 AM	175	278	30	2	441	141	99	166	10	28	12	14	1,396
07:15 AM	---	08:15 AM	179	314	47	3	446	156	97	161	16	25	20	18	1,482
07:30 AM	---	08:30 AM	180	335	63	3	432	158	103	153	19	24	24	22	1,516
07:45 AM	---	08:45 AM	162	361	71	3	411	142	91	134	23	18	28	20	1,464
08:00 AM	---	09:00 AM	163	356	65	3	362	122	80	125	23	17	25	21	1,362

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: E. 2ND STREET SURVEY TIME: 7:00 AM TO 9:00 AM
 E-W Approach: ROSE DRIVE CITY: BENICIA FILE NAME: 7AM

PEAK HOUR

07:30 AM TO 08:30 AM

ARRIVAL / DEPARTURE VOLUMES

PHF= 0.81

269 391

PHF= ERR

139

507

PHF= 0.91

588 342

PHF= 0.78

North

ROSE DRIVE

E. 2ND STREET

TIME PERIOD

NORTHBOUND

SOUTHBOUND

EASTBOUND

WESTBOUND

From To Left Thru Right Left Thru Right Left Thru Right Left Thru Right TOTAL

SURVEY DATA

07:00 AM	---	07:15 AM	17	64	0	0	21	7	32	0	61	0	0	0	202
07:15 AM	---	07:30 AM	28	119	0	0	51	17	74	0	143	0	0	0	432
07:30 AM	---	07:45 AM	39	171	0	0	91	24	120	0	229	0	0	0	674
07:45 AM	---	08:00 AM	61	220	0	0	152	33	155	0	334	0	0	0	955
08:00 AM	---	08:15 AM	102	289	0	0	227	41	192	0	415	0	0	0	1,266
08:15 AM	---	08:30 AM	128	361	0	0	281	56	223	0	501	0	0	0	1,550
08:30 AM	---	08:45 AM	151	416	0	0	326	67	249	0	577	0	0	0	1,786
08:45 AM	---	09:00 AM	168	466	0	0	374	77	270	0	645	0	0	0	2,000

TOTAL BY PERIOD

07:00 AM	---	07:15 AM	17	64	0	0	21	7	32	0	61	0	0	0	202
07:15 AM	---	07:30 AM	11	55	0	0	30	10	42	0	82	0	0	0	230
07:30 AM	---	07:45 AM	11	52	0	0	40	7	46	0	86	0	0	0	242
07:45 AM	---	08:00 AM	22	49	0	0	61	9	35	0	105	0	0	0	281
08:00 AM	---	08:15 AM	41	69	0	0	75	8	37	0	81	0	0	0	311
08:15 AM	---	08:30 AM	26	72	0	0	54	15	31	0	86	0	0	0	284
08:30 AM	---	08:45 AM	23	55	0	0	45	11	26	0	76	0	0	0	236
08:45 AM	---	09:00 AM	17	50	0	0	48	10	21	0	68	0	0	0	214

HOURLY TOTALS

07:00 AM	---	08:00 AM	61	220	0	0	152	33	155	0	334	0	0	0	955
07:15 AM	---	08:15 AM	85	225	0	0	206	34	160	0	354	0	0	0	1,064
07:30 AM	---	08:30 AM	100	242	0	0	230	39	149	0	358	0	0	0	1,118
07:45 AM	---	08:45 AM	112	245	0	0	235	43	129	0	348	0	0	0	1,112
08:00 AM	---	09:00 AM	107	246	0	0	222	44	115	0	311	0	0	0	1,045

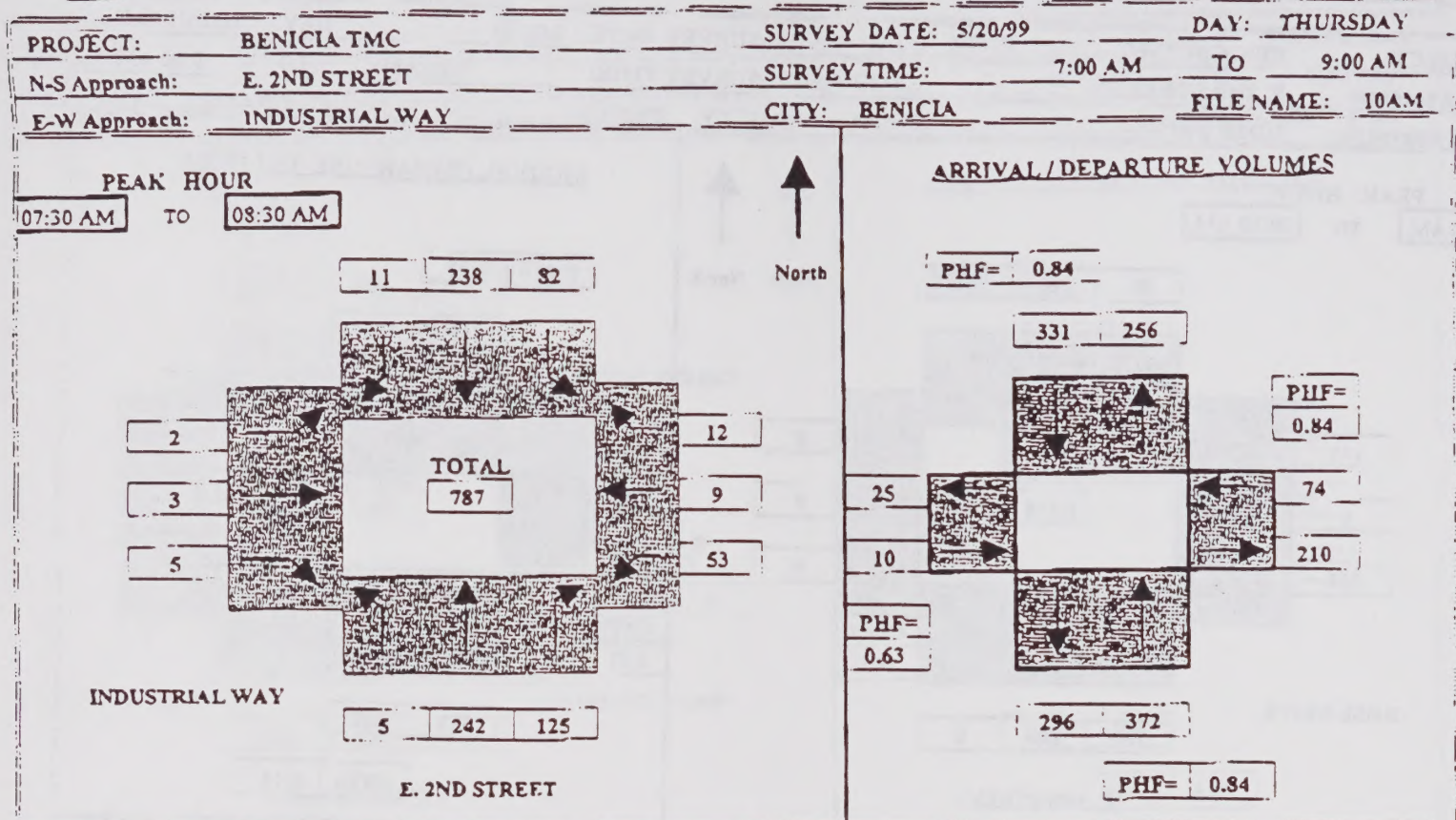
Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	0	64	26	12	26	4	0	0	0	15	0	3	150
07:15 AM	---	07:30 AM	0	138	60	28	55	10	0	0	1	34	0	3	329
07:30 AM	---	07:45 AM	2	191	95	50	96	12	0	2	2	48	2	5	505
07:45 AM	---	08:00 AM	3	266	130	76	164	17	1	3	3	60	4	7	734
08:00 AM	---	08:15 AM	3	318	156	95	223	18	2	3	4	76	5	10	913
08:15 AM	---	08:30 AM	5	380	185	110	293	21	2	3	6	87	9	15	1,116
08:30 AM	---	08:45 AM	8	434	208	121	332	23	2	5	6	102	12	19	1,272
08:45 AM	---	09:00 AM	10	487	228	138	369	26	3	5	9	115	16	22	1,428
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	0	64	26	12	26	4	0	0	0	15	0	3	150
07:15 AM	---	07:30 AM	0	74	34	16	29	6	0	0	1	19	0	0	179
07:30 AM	---	07:45 AM	2	53	35	22	41	2	0	2	1	14	2	2	176
07:45 AM	---	08:00 AM	1	75	35	26	68	5	1	1	1	12	2	2	229
08:00 AM	---	08:15 AM	0	52	26	19	59	1	1	0	1	16	1	3	179
08:15 AM	---	08:30 AM	2	62	29	15	70	3	0	0	2	11	4	5	203
08:30 AM	---	08:45 AM	3	54	23	11	39	2	0	2	0	15	3	4	156
08:45 AM	---	09:00 AM	2	53	20	17	37	3	1	0	3	13	4	3	156
HOURLY TOTALS															
07:00 AM	---	08:00 AM	3	266	130	76	164	17	1	3	3	60	4	7	734
07:15 AM	---	08:15 AM	3	254	130	83	197	14	2	3	4	61	5	7	763
07:30 AM	---	08:30 AM	5	242	125	82	238	11	2	3	5	53	9	12	787
07:45 AM	---	08:45 AM	6	243	113	71	236	11	2	3	4	54	10	14	767
08:00 AM	---	09:00 AM	7	221	98	62	205	9	2	2	6	55	12	15	694
Contra Costa County: (510) 232-1271			SF/Peninsula: (415) 750-1317						Alameda County: (510) 233-2292						

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: E. 2ND STREET SURVEY TIME: 7:00 AM TO 9:00 AM
 E-W Approach: LAKE HERMAN ROAD CITY: BENICIA FILE NAME: 17AM

PEAK HOUR
 07:15 AM TO 08:15 AM

2 15 1



ARRIVAL / DEPARTURE VOLUMES

PHF= 0.50

18 27

PHF= 0.50

129

532

68

250

PHF= 0.53

436 223

PHF= 0.84

LAKE HERMAN ROAD

3 8 212

E. 2ND STREET

TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	0	0	45	0	0	0	0	3	2	78	15	2	145
07:15 AM	---	07:30 AM	0	2	109	0	2	0	0	10	5	185	41	3	357
07:30 AM	---	07:45 AM	0	3	164	0	4	1	0	18	9	290	65	5	559
07:45 AM	---	08:00 AM	1	5	217	1	10	1	0	31	18	384	98	12	778
08:00 AM	---	08:15 AM	3	8	257	1	15	2	2	40	31	470	138	19	986
08:15 AM	---	08:30 AM	7	10	299	2	23	2	2	50	47	527	170	23	1,162
08:30 AM	---	08:45 AM	10	13	335	2	30	2	2	62	60	594	196	30	1,336
08:45 AM	---	09:00 AM	12	16	376	3	35	3	2	76	78	642	231	35	1,509

TOTAL BY PERIOD

07:00 AM	---	07:15 AM	0	0	45	0	0	0	0	3	2	78	15	2	145
07:15 AM	---	07:30 AM	0	2	64	0	2	0	0	7	3	107	26	1	212
07:30 AM	---	07:45 AM	0	1	55	0	2	1	0	8	4	105	24	2	202
07:45 AM	---	08:00 AM	1	2	53	1	6	0	0	13	9	94	33	7	219
08:00 AM	---	08:15 AM	2	3	40	0	5	1	2	9	13	86	40	7	208
08:15 AM	---	08:30 AM	4	2	42	1	8	0	0	10	16	57	32	4	176
08:30 AM	---	08:45 AM	3	3	36	0	7	0	0	12	13	67	26	7	174
08:45 AM	---	09:00 AM	2	3	41	1	5	1	0	14	18	48	35	5	173

HOURLY TOTALS

07:00 AM	---	08:00 AM	1	5	217	1	10	1	0	31	18	384	98	12	778
07:15 AM	---	08:15 AM	3	8	212	1	15	2	2	37	29	392	123	17	841
07:30 AM	---	08:30 AM	7	8	190	2	21	2	2	40	42	342	129	20	805
07:45 AM	---	08:45 AM	10	10	171	2	26	1	2	44	51	304	131	25	777
08:00 AM	---	09:00 AM	11	11	159	2	25	2	2	45	60	258	133	23	751

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC		SURVEY DATE: 5/20/99		DAY: THURSDAY	
N-S Approach: I-680 SB RAMPs		SURVEY TIME: 7:00 AM		TO 9:00 AM	
E-W Approach: LAKE HERMAN ROAD		CITY: BENICIA		FILE NAME: 18AM	

PEAK HOUR
07:15 AM TO 08:15 AM

TOTAL
893

LAKE HERMAN ROAD

I-680 SB RAMPs

ARRIVAL / DEPARTURE VOLUMES

PHF= 0.93

440 0

PHF= 0.85

537 201

252 238

PHF= 0.90

118 0

PHF= ERR

TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	0	0	0	7	0	67	0	43	8	5	22	0	152
07:15 AM	---	07:30 AM	0	0	0	17	0	175	0	102	19	13	53	0	379
07:30 AM	---	07:45 AM	0	0	0	28	0	267	0	143	35	25	93	0	591
07:45 AM	---	08:00 AM	0	0	0	36	0	368	0	199	48	44	128	0	823
08:00 AM	---	08:15 AM	0	0	0	50	0	464	0	238	65	66	162	0	1,045
08:15 AM	---	08:30 AM	0	0	0	59	0	529	0	269	77	86	191	0	1,211
08:30 AM	---	08:45 AM	0	0	0	67	0	596	0	306	97	111	224	0	1,401
08:45 AM	---	09:00 AM	0	0	0	80	0	646	0	345	113	130	264	0	1,578
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	0	0	0	7	0	67	0	43	8	5	22	0	152
07:15 AM	---	07:30 AM	0	0	0	10	0	108	0	59	11	8	31	0	227
07:30 AM	---	07:45 AM	0	0	0	11	0	92	0	41	16	12	40	0	212
07:45 AM	---	08:00 AM	0	0	0	8	0	101	0	56	13	19	35	0	232
08:00 AM	---	08:15 AM	0	0	0	14	0	96	0	39	17	22	34	0	222
08:15 AM	---	08:30 AM	0	0	0	9	0	65	0	31	12	20	29	0	166
08:30 AM	---	08:45 AM	0	0	0	8	0	67	0	37	20	25	33	0	190
08:45 AM	---	09:00 AM	0	0	0	13	0	50	0	39	16	19	40	0	177
HOURLY TOTALS															
07:00 AM	---	08:00 AM	0	0	0	36	0	368	0	199	48	44	128	0	823
07:15 AM	---	08:15 AM	0	0	0	43	0	397	0	195	57	61	140	0	893
07:30 AM	---	08:30 AM	0	0	0	42	0	354	0	167	58	73	138	0	852
07:45 AM	---	08:45 AM	0	0	0	39	0	329	0	163	62	86	131	0	810
08:00 AM	---	09:00 AM	0	0	0	44	0	278	0	146	65	86	136	0	755
Contra Costa County: (510) 232-1271			SF/Peninsula: (415) 750-1317						Alameda County: (510) 233-2292						

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC
N-S Approach: I-680 NB RAMP
E-W Approach: LAKE HERMAN ROAD

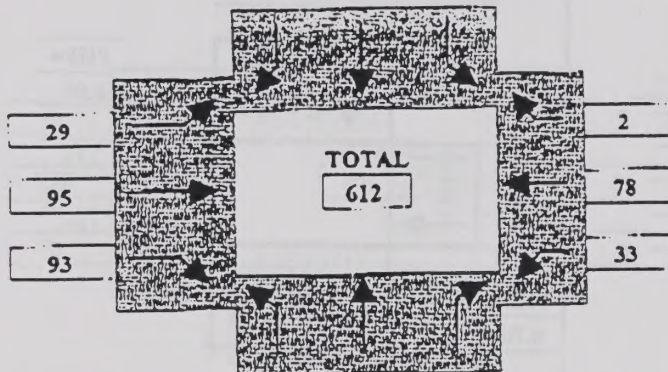
SURVEY DATE: 5/20/99
SURVEY TIME: 7:00 AM TO 9:00 AM
CITY: BENICIA
FILE NAME: 19AM

PEAK HOUR
07:45 AM TO 08:45 AM



GOODYEAR ROAD

14 3 4



LAKE HERMAN ROAD

129 65 67

I-680 NB RAMP

ARRIVAL / DEPARTURE VOLUMES

PHF= 0.38

21 96

PHF= 0.78

221

113

217

166

PHF= 0.80

129 261

PHF= 0.89

TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	19	2	16	2	0	5	3	23	16	2	7	0	95
07:15 AM	---	07:30 AM	45	7	39	2	0	7	8	61	41	3	17	0	230
07:30 AM	---	07:45 AM	80	11	66	3	2	8	12	86	68	9	28	0	373
07:45 AM	---	08:00 AM	114	20	86	3	2	12	20	116	94	16	41	1	525
08:00 AM	---	08:15 AM	153	36	104	5	4	14	27	137	115	27	65	2	689
08:15 AM	---	08:30 AM	179	58	118	5	5	17	32	158	135	35	84	2	828
08:30 AM	---	08:45 AM	209	76	133	7	5	22	41	181	161	42	106	2	985
08:45 AM	---	09:00 AM	240	93	153	9	5	26	47	203	180	52	124	2	1,134

TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	19	2	16	2	0	5	3	23	16	2	7	0	95
07:15 AM	---	07:30 AM	26	5	23	0	0	2	5	38	25	1	10	0	135
07:30 AM	---	07:45 AM	35	4	27	1	2	1	4	25	27	6	11	0	143
07:45 AM	---	08:00 AM	34	9	20	0	0	4	8	30	26	7	13	1	152
08:00 AM	---	08:15 AM	39	16	18	2	2	2	7	21	21	11	24	1	164
08:15 AM	---	08:30 AM	26	22	14	0	1	3	5	21	20	8	19	0	139
08:30 AM	---	08:45 AM	30	18	15	2	0	5	9	23	26	7	22	0	157
08:45 AM	---	09:00 AM	31	17	20	2	0	4	6	22	19	10	18	0	149

HOURLY TOTALS															
07:00 AM	---	08:00 AM	114	20	86	3	2	12	20	116	94	16	41	1	525
07:15 AM	---	08:15 AM	134	34	88	3	4	9	24	114	99	25	58	2	594
07:30 AM	---	08:30 AM	134	51	79	3	5	10	24	97	94	32	67	2	598
07:45 AM	---	08:45 AM	129	65	67	4	3	14	29	95	93	33	78	2	612
08:00 AM	---	09:00 AM	126	73	67	6	3	14	27	87	86	36	83	1	609

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

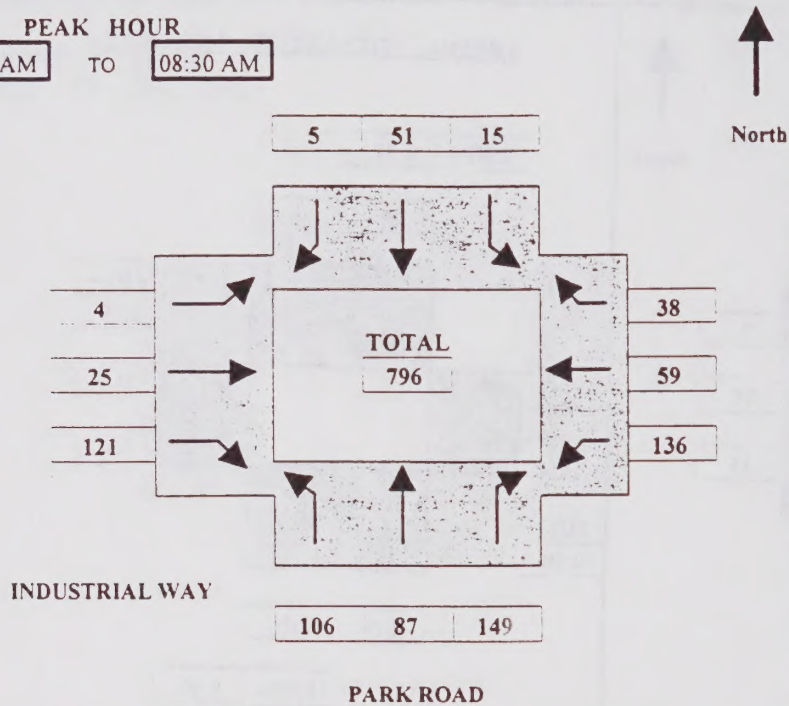
Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

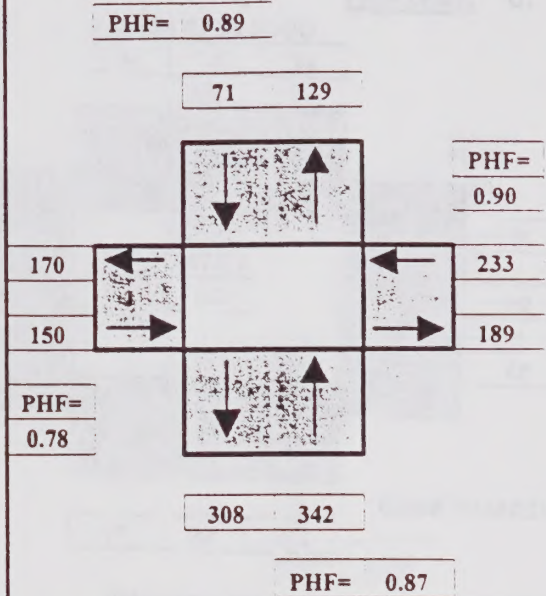
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	BENICIA TMC	SURVEY DATE:	5/20/99	DAY:	THURSDAY
N-S Approach:	PARK ROAD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W Approach:	INDUSTRIAL WAY	CITY:	BENICIA	FILE NAME:	14AM

PEAK HOUR
07:30 AM TO 08:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	16	22	24	4	14	0	0	2	26	20	14	2	144
07:15 AM	---	07:30 AM	31	40	66	6	23	0	2	5	58	49	30	5	315
07:30 AM	---	07:45 AM	59	67	101	11	36	1	3	10	100	90	41	12	531
07:45 AM	---	08:00 AM	91	89	145	14	52	2	3	17	130	126	58	24	751
08:00 AM	---	08:15 AM	115	107	182	16	62	5	5	23	153	158	73	32	931
08:15 AM	---	08:30 AM	137	127	215	21	74	5	6	30	179	185	89	43	1,111
08:30 AM	---	08:45 AM	166	142	244	23	82	7	8	35	198	215	101	52	1,273
08:45 AM	---	09:00 AM	186	160	275	28	93	9	8	41	220	248	118	62	1,448
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	16	22	24	4	14	0	0	2	26	20	14	2	144
07:15 AM	---	07:30 AM	15	18	42	2	9	0	2	3	32	29	16	3	171
07:30 AM	---	07:45 AM	28	27	35	5	13	1	1	5	42	41	11	7	216
07:45 AM	---	08:00 AM	32	22	44	3	16	1	0	7	30	36	17	12	220
08:00 AM	---	08:15 AM	24	18	37	2	10	3	2	6	23	32	15	8	180
08:15 AM	---	08:30 AM	22	20	33	5	12	0	1	7	26	27	16	11	180
08:30 AM	---	08:45 AM	29	15	29	2	8	2	2	5	19	30	12	9	162
08:45 AM	---	09:00 AM	20	18	31	5	11	2	0	6	22	33	17	10	175
HOURLY TOTALS															
07:00 AM	---	08:00 AM	91	89	145	14	52	2	3	17	130	126	58	24	751
07:15 AM	---	08:15 AM	99	85	158	12	48	5	5	21	127	138	59	30	787
07:30 AM	---	08:30 AM	106	87	149	15	51	5	4	25	121	136	59	38	796
07:45 AM	---	08:45 AM	107	75	143	12	46	6	5	25	98	125	60	40	742
08:00 AM	---	09:00 AM	95	71	130	14	41	7	5	24	90	122	60	38	697

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: I-680 SB OFF-RAMP SURVEY TIME: 7:00 AM TO 9:00 AM
 E-W Approach: INDUSTRIAL WAY CITY: BENICIA FILE NAME: 15AM

PEAK HOUR

07:30 AM TO 08:30 AM



North

ARRIVAL / DEPARTURE VOLUMES

PHF= 0.79

232 0

PHF= 0.59

232

57

186

243

PHF= 0.82

0 0

PHF= ERR

INDUSTRIAL WAY

I-680 SB OFF-RAMP

TOTAL
475

175 0 57

0

186

0

0

57

0

0 0 0

TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	

SURVEY DATA

07:00 AM	---	07:15 AM	0	0	0	3	0	27	0	32	0	0	10	0	72
07:15 AM	---	07:30 AM	0	0	0	9	0	61	0	78	0	0	25	0	173
07:30 AM	---	07:45 AM	0	0	0	19	0	104	0	120	0	0	37	0	280
07:45 AM	---	08:00 AM	0	0	0	36	0	160	0	177	0	0	51	0	424
08:00 AM	---	08:15 AM	0	0	0	50	0	199	0	221	0	0	64	0	534
08:15 AM	---	08:30 AM	0	0	0	66	0	236	0	264	0	0	82	0	648
08:30 AM	---	08:45 AM	0	0	0	77	0	264	0	302	0	0	106	0	749
08:45 AM	---	09:00 AM	0	0	0	87	0	304	0	345	0	0	125	0	861

TOTAL BY PERIOD

07:00 AM	---	07:15 AM	0	0	0	3	0	27	0	32	0	0	10	0	72
07:15 AM	---	07:30 AM	0	0	0	6	0	34	0	46	0	0	15	0	101
07:30 AM	---	07:45 AM	0	0	0	10	0	43	0	42	0	0	12	0	107
07:45 AM	---	08:00 AM	0	0	0	17	0	56	0	57	0	0	14	0	144
08:00 AM	---	08:15 AM	0	0	0	14	0	39	0	44	0	0	13	0	110
08:15 AM	---	08:30 AM	0	0	0	16	0	37	0	43	0	0	18	0	114
08:30 AM	---	08:45 AM	0	0	0	11	0	28	0	38	0	0	24	0	101
08:45 AM	---	09:00 AM	0	0	0	10	0	40	0	43	0	0	19	0	112

HOURLY TOTALS

07:00 AM	---	08:00 AM	0	0	0	36	0	160	0	177	0	0	51	0	424
07:15 AM	---	08:15 AM	0	0	0	47	0	172	0	189	0	0	54	0	462
07:30 AM	---	08:30 AM	0	0	0	57	0	175	0	186	0	0	57	0	475
07:45 AM	---	08:45 AM	0	0	0	58	0	160	0	182	0	0	69	0	469
08:00 AM	---	09:00 AM	0	0	0	51	0	144	0	168	0	0	74	0	437

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

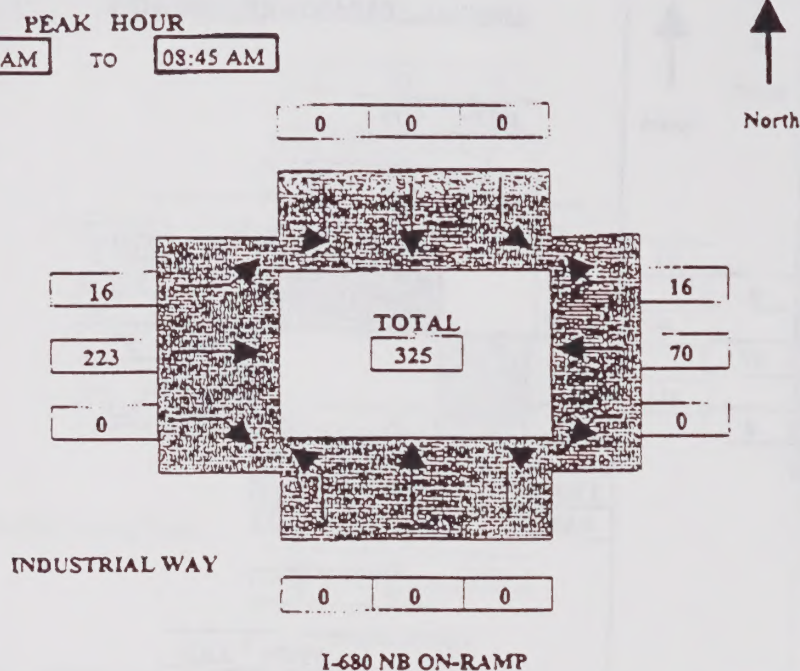
Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

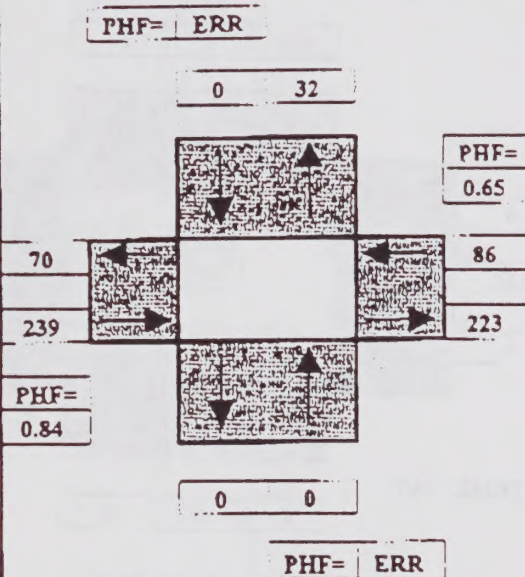
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: I-680 NB ON-RAMP SURVEY TIME: 7:00 AM TO 9:00 AM
 E-W Approach: INDUSTRIAL WAY CITY: BENICIA FILE NAME: 16AM

PEAK HOUR
 07:45 AM TO 08:45 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	0	0	0	0	0	0	9	26	0	0	10	2	47
07:15 AM	---	07:30 AM	0	0	0	0	0	0	21	66	0	0	25	2	114
07:30 AM	---	07:45 AM	0	0	0	0	0	0	28	113	0	0	38	3	182
07:45 AM	---	08:00 AM	0	0	0	0	0	0	33	179	0	0	53	5	270
08:00 AM	---	08:15 AM	0	0	0	0	0	0	37	236	0	0	63	7	343
08:15 AM	---	08:30 AM	0	0	0	0	0	0	39	291	0	0	82	12	424
08:30 AM	---	08:45 AM	0	0	0	0	0	0	44	336	0	0	108	19	507
08:45 AM	---	09:00 AM	0	0	0	0	0	0	47	383	0	0	124	25	579
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	0	0	0	0	0	0	9	26	0	0	10	2	47
07:15 AM	---	07:30 AM	0	0	0	0	0	0	12	40	0	0	15	0	67
07:30 AM	---	07:45 AM	0	0	0	0	0	0	7	47	0	0	13	1	68
07:45 AM	---	08:00 AM	0	0	0	0	0	0	5	66	0	0	15	2	88
08:00 AM	---	08:15 AM	0	0	0	0	0	0	4	57	0	0	10	2	73
08:15 AM	---	08:30 AM	0	0	0	0	0	0	2	55	0	0	19	5	81
08:30 AM	---	08:45 AM	0	0	0	0	0	0	5	45	0	0	26	7	83
08:45 AM	---	09:00 AM	0	0	0	0	0	0	3	47	0	0	16	6	72
HOURLY TOTALS															
07:00 AM	---	08:00 AM	0	0	0	0	0	0	33	179	0	0	53	5	270
07:15 AM	---	08:15 AM	0	0	0	0	0	0	28	210	0	0	53	5	296
07:30 AM	---	08:30 AM	0	0	0	0	0	0	18	225	0	0	57	10	310
07:45 AM	---	08:45 AM	0	0	0	0	0	0	16	223	0	0	70	16	325
08:00 AM	---	09:00 AM	0	0	0	0	0	0	14	204	0	0	71	20	309
Contra Costa County: (510) 232-1271			SF/Peninsula: (415) 750-1317						Alameda County: (510) 233-2292						

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

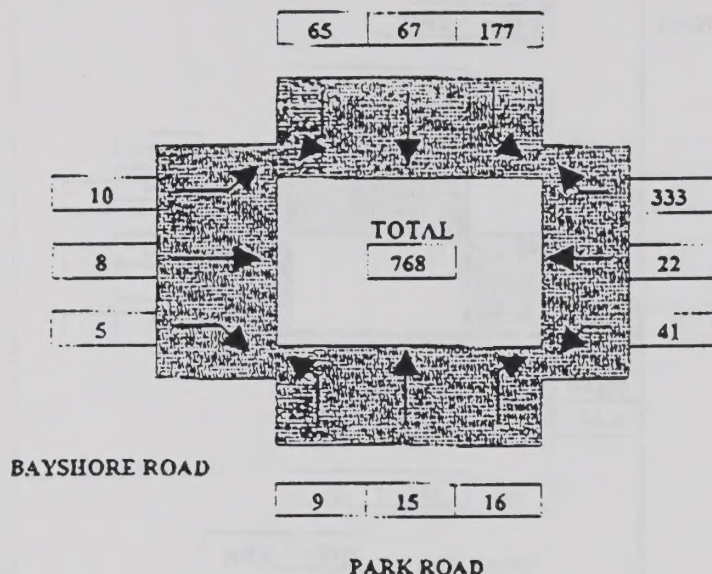
Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

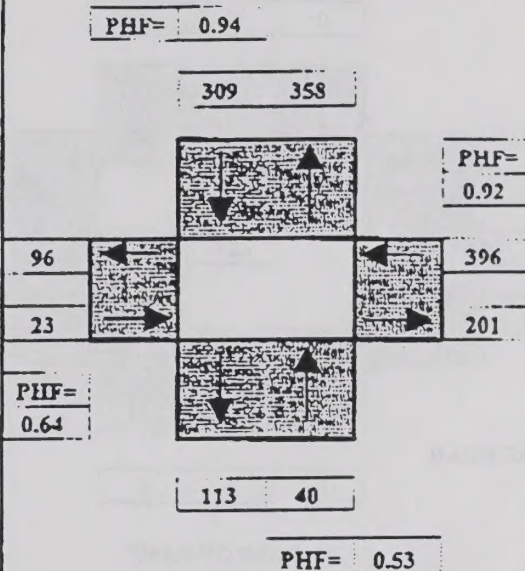
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: PARK ROAD SURVEY TIME: 7:00 AM TO 9:00 AM
 E-W Approach: BAYSHORE ROAD CITY: BENICIA FILE NAME: 11AM

PEAK HOUR
 07:15 AM TO 08:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	1	4	0	42	12	4	0	2	2	12	2	67	148
07:15 AM	---	07:30 AM	3	8	2	95	29	13	2	3	3	20	5	155	338
07:30 AM	---	07:45 AM	5	10	3	142	39	37	5	5	3	31	10	247	537
07:45 AM	---	08:00 AM	7	13	8	182	57	56	9	5	5	39	16	330	727
08:00 AM	---	08:15 AM	10	19	16	219	79	69	10	10	7	53	24	400	916
08:15 AM	---	08:30 AM	12	29	23	265	95	77	13	13	10	61	29	461	1,088
08:30 AM	---	08:45 AM	13	36	28	315	118	86	14	16	11	76	36	514	1,263
08:45 AM	---	09:00 AM	16	42	36	358	135	92	16	18	13	88	42	562	1,418

TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	1	4	0	42	12	4	0	2	2	12	2	67	148
07:15 AM	---	07:30 AM	2	4	2	53	17	9	2	1	1	8	3	88	190
07:30 AM	---	07:45 AM	2	2	1	47	10	24	3	2	0	11	5	92	199
07:45 AM	---	08:00 AM	2	3	5	40	18	19	4	0	2	8	6	83	190
08:00 AM	---	08:15 AM	3	6	8	37	22	13	1	5	2	14	8	70	189
08:15 AM	---	08:30 AM	2	10	7	46	16	8	3	3	3	8	5	61	172
08:30 AM	---	08:45 AM	1	7	5	50	23	9	1	3	1	15	7	53	175
08:45 AM	---	09:00 AM	3	6	8	43	17	6	2	2	2	12	6	48	155

HOURLY TOTALS															
07:00 AM	---	08:00 AM	7	13	8	182	57	56	9	5	5	39	16	330	727
07:15 AM	---	08:15 AM	9	15	16	177	67	65	10	8	5	41	22	333	768
07:30 AM	---	08:30 AM	9	21	21	170	66	64	11	10	7	41	24	306	750
07:45 AM	---	08:45 AM	8	26	25	173	79	49	9	11	8	45	26	267	726
08:00 AM	---	09:00 AM	9	29	28	176	78	36	7	13	8	49	26	232	691

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC

SURVEY DATE: 5/20/99

DAY: THURSDAY

N-S Approach: I-680 SB ON-RAMP

SURVEY TIME: 7:00 AM TO 9:00 AM

E-W Approach: BAYSHORE ROAD

CITY: BENICIA

FILE NAME: 12AM

PEAK HOUR

07:15 AM TO 08:15 AM



ARRIVAL/DEPARTURE VOLUMES

PHF= ERR

0 0

PIIF= 0.94

389

420

204

54

PHF= 0.44

181 0

PHF= ERR

BAYSHORE ROAD

I-680 SB ON-RAMP

TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	14	33	6	85	0	138
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	24	81	11	182	0	298
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	33	106	18	283	0	440
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	46	151	26	387	0	610
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	68	183	37	474	0	762
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	102	205	46	555	0	908
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	127	232	56	624	0	1,039
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	159	253	69	689	0	1,170
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	14	33	6	85	0	138
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	10	48	5	97	0	160
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	9	25	7	101	0	142
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	13	45	8	104	0	170
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	22	32	11	87	0	152
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	34	22	9	81	0	146
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	25	27	10	69	0	151
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	32	21	13	65	0	131
HOURLY TOTALS															
07:00 AM	---	08:00 AM	0	0	0	0	0	0	0	46	151	26	387	0	610
07:15 AM	---	08:15 AM	0	0	0	0	0	0	0	54	150	31	389	0	624
07:30 AM	---	08:30 AM	0	0	0	0	0	0	0	78	124	35	373	0	610
07:45 AM	---	08:45 AM	0	0	0	0	0	0	0	94	126	38	341	0	599
08:00 AM	---	09:00 AM	0	0	0	0	0	0	0	113	102	43	302	0	560

Contra Costa County: (510) 232-1271

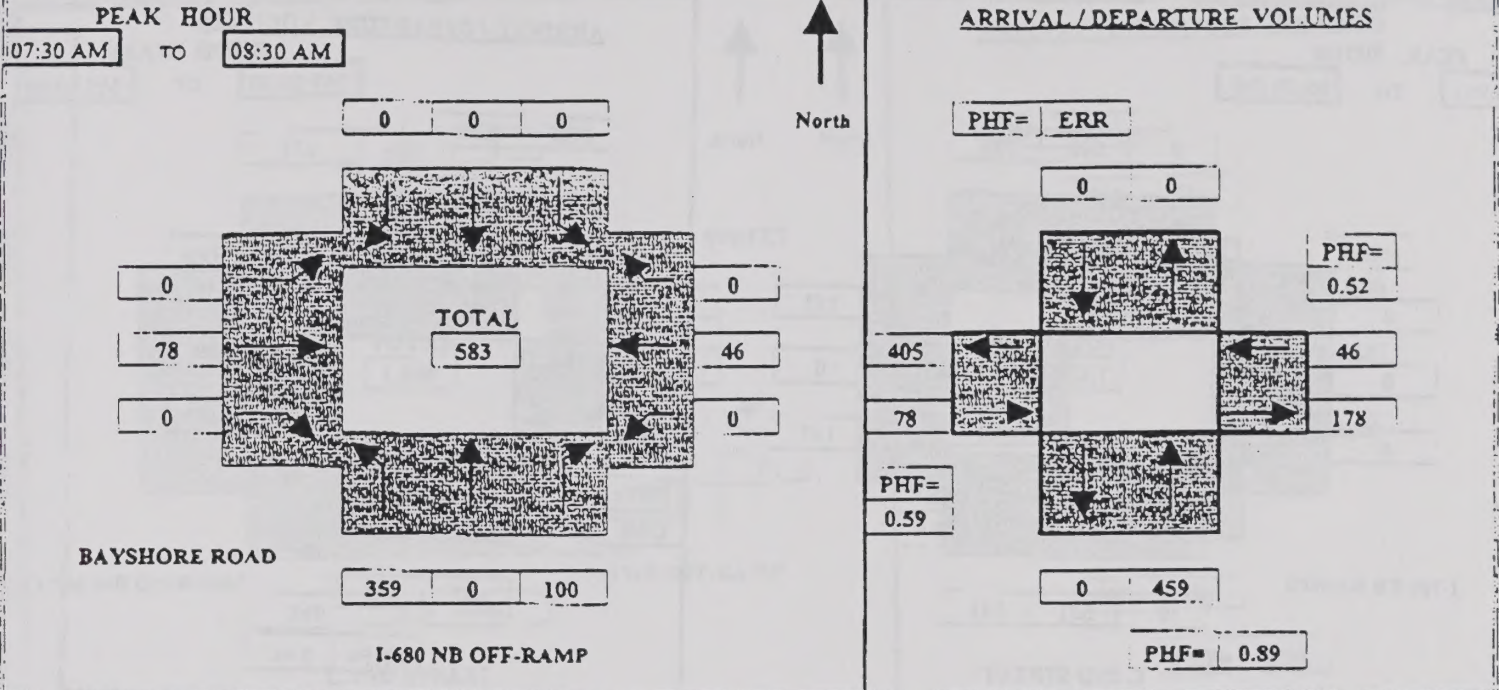
SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

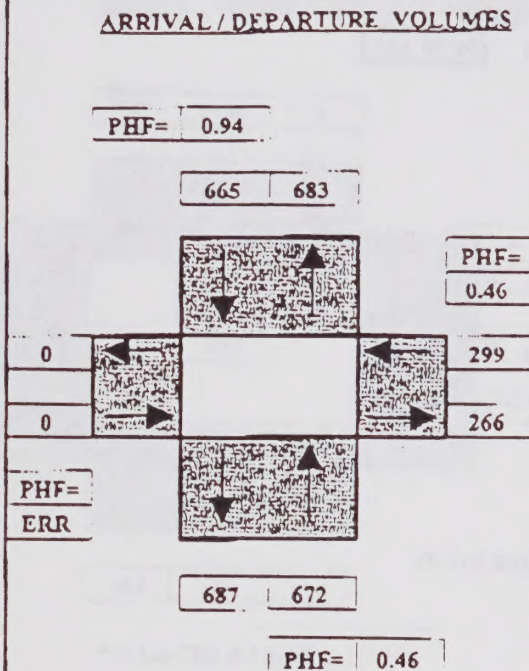
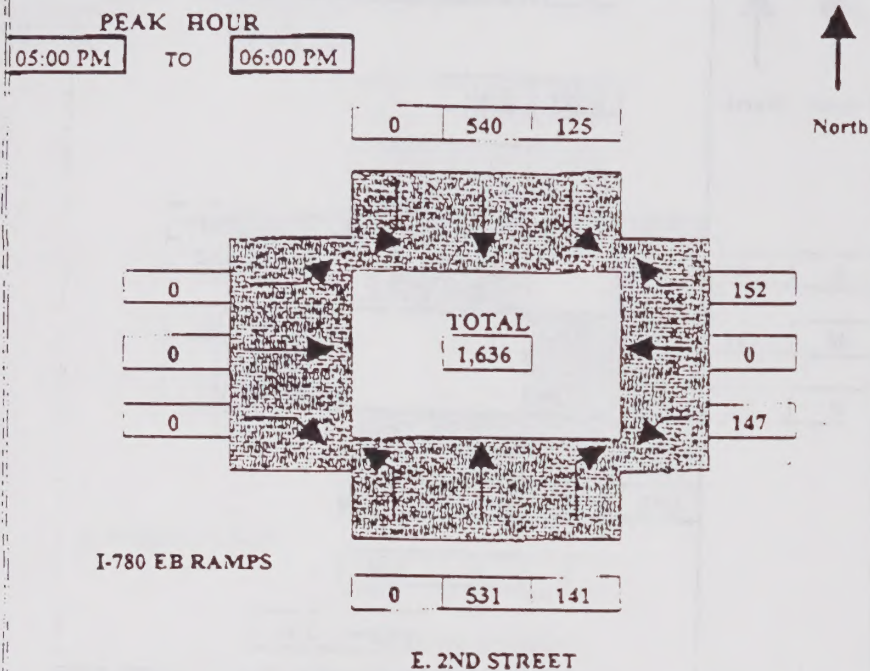
PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: I-680 NB OFF-RAMP SURVEY TIME: 7:00 AM TO 9:00 AM
 E-W Approach: BAYSHORE ROAD CITY: BENICIA FILE NAME: 13AM



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
07:00 AM	---	07:15 AM	82	0	16	0	0	0	0	14	0	0	8	0	120
07:15 AM	---	07:30 AM	180	0	38	0	0	0	0	24	0	0	15	0	257
07:30 AM	---	07:45 AM	277	0	70	0	0	0	0	35	0	0	24	0	406
07:45 AM	---	08:00 AM	378	0	95	0	0	0	0	47	0	0	37	0	557
08:00 AM	---	08:15 AM	467	0	114	0	0	0	0	69	0	0	45	0	695
08:15 AM	---	08:30 AM	539	0	138	0	0	0	0	102	0	0	61	0	840
08:30 AM	---	08:45 AM	600	0	168	0	0	0	0	127	0	0	80	0	975
08:45 AM	---	09:00 AM	658	0	190	0	0	0	0	159	0	0	102	0	1,109
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	82	0	16	0	0	0	0	14	0	0	8	0	120
07:15 AM	---	07:30 AM	98	0	22	0	0	0	0	10	0	0	7	0	137
07:30 AM	---	07:45 AM	97	0	32	0	0	0	0	11	0	0	9	0	149
07:45 AM	---	08:00 AM	101	0	25	0	0	0	0	12	0	0	13	0	151
08:00 AM	---	08:15 AM	89	0	19	0	0	0	0	22	0	0	8	0	138
08:15 AM	---	08:30 AM	72	0	24	0	0	0	0	33	0	0	16	0	145
08:30 AM	---	08:45 AM	61	0	30	0	0	0	0	25	0	0	19	0	135
08:45 AM	---	09:00 AM	58	0	22	0	0	0	0	32	0	0	22	0	134
HOURLY TOTALS															
07:00 AM	---	08:00 AM	378	0	95	0	0	0	0	47	0	0	37	0	557
07:15 AM	---	08:15 AM	385	0	98	0	0	0	0	55	0	0	37	0	575
07:30 AM	---	08:30 AM	359	0	100	0	0	0	0	78	0	0	46	0	583
07:45 AM	---	08:45 AM	323	0	98	0	0	0	0	92	0	0	56	0	569
08:00 AM	---	09:00 AM	280	0	95	0	0	0	0	112	0	0	65	0	552
Contra Costa County: (510) 232-1271 SF/Peninsula: (415) 750-1317 Alameda County: (510) 233-2292															

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT:	BENICIA TMC	SURVEY DATE:	5/19/99	DAY:	WEDNESDAY
N-S Approach:	E. 2ND STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W Approach:	I-780 EB RAMP	CITY:	BENICIA	FILE NAME:	SPM



TIME PERIOD		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	

SURVEY DATA

04:00 PM	---	04:15 PM	0	134	32	20	109	0	0	0	0	42	0	26	363
04:15 PM	---	04:30 PM	0	255	78	37	233	0	0	0	0	88	0	61	752
04:30 PM	---	04:45 PM	0	389	128	59	344	0	0	0	0	139	0	91	1,150
04:45 PM	---	05:00 PM	0	508	170	77	489	0	0	0	0	182	0	125	1,551
05:00 PM	---	05:15 PM	0	641	204	103	627	0	0	0	0	217	0	167	1,959
05:15 PM	---	05:30 PM	0	762	247	137	770	0	0	0	0	257	0	204	2,377
05:30 PM	---	05:45 PM	0	911	282	167	898	0	0	0	0	290	0	236	2,784
05:45 PM	---	06:00 PM	0	1,039	311	202	1,029	0	0	0	0	329	0	277	3,187

TOTAL BY PERIOD

04:00 PM	---	04:15 PM	0	134	32	20	109	0	0	0	0	42	0	26	363
04:15 PM	---	04:30 PM	0	121	46	17	124	0	0	0	0	46	0	35	389
04:30 PM	---	04:45 PM	0	134	50	22	111	0	0	0	0	51	0	30	398
04:45 PM	---	05:00 PM	0	119	42	18	145	0	0	0	0	43	0	34	401
05:00 PM	---	05:15 PM	0	133	34	26	138	0	0	0	0	35	0	42	408
05:15 PM	---	05:30 PM	0	121	43	34	143	0	0	0	0	40	0	37	418
05:30 PM	---	05:45 PM	0	149	35	30	128	0	0	0	0	33	0	32	407
05:45 PM	---	06:00 PM	0	128	29	35	131	0	0	0	0	39	0	41	403

HOURLY TOTALS

04:00 PM	---	05:00 PM	0	508	170	77	489	0	0	0	0	182	0	125	1,551
04:15 PM	---	05:15 PM	0	507	172	83	518	0	0	0	0	175	0	141	1,596
04:30 PM	---	05:30 PM	0	507	169	100	537	0	0	0	0	169	0	143	1,625
04:45 PM	---	05:45 PM	0	522	154	108	554	0	0	0	0	151	0	145	1,634
05:00 PM	---	06:00 PM	0	531	141	125	540	0	0	0	0	147	0	152	1,636

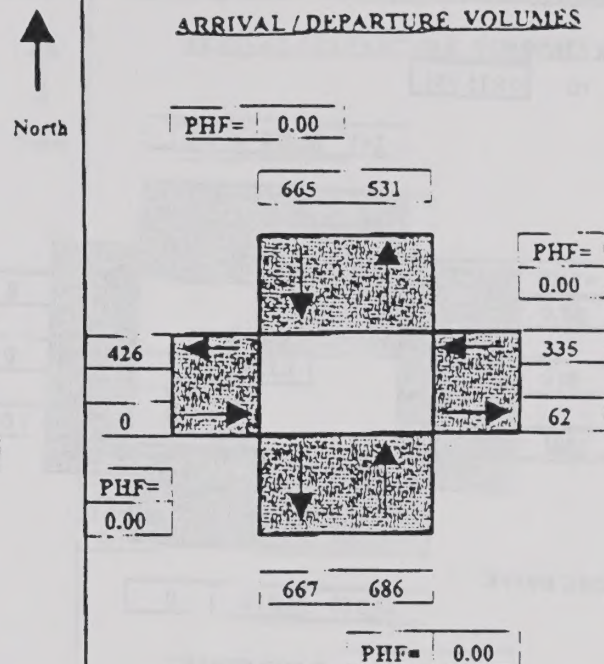
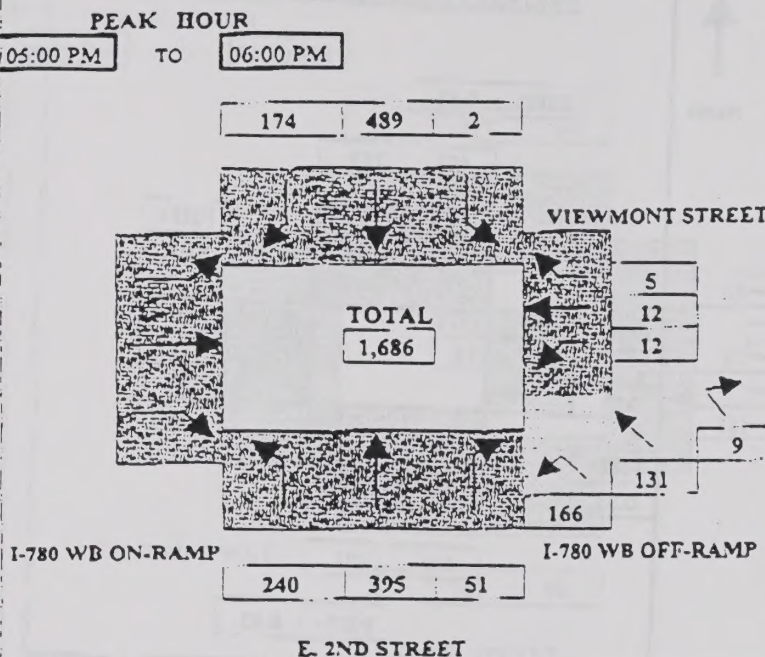
Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT: BENICIA TMC SURVEY DATE: 5/19/99 DAY: WEDNESDAY
 N-S Approach: E. 2ND STREET SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: I-780 WB RAMPS - VIEWMONT STREET CITY: BENICIA FILE NAME: 6PM



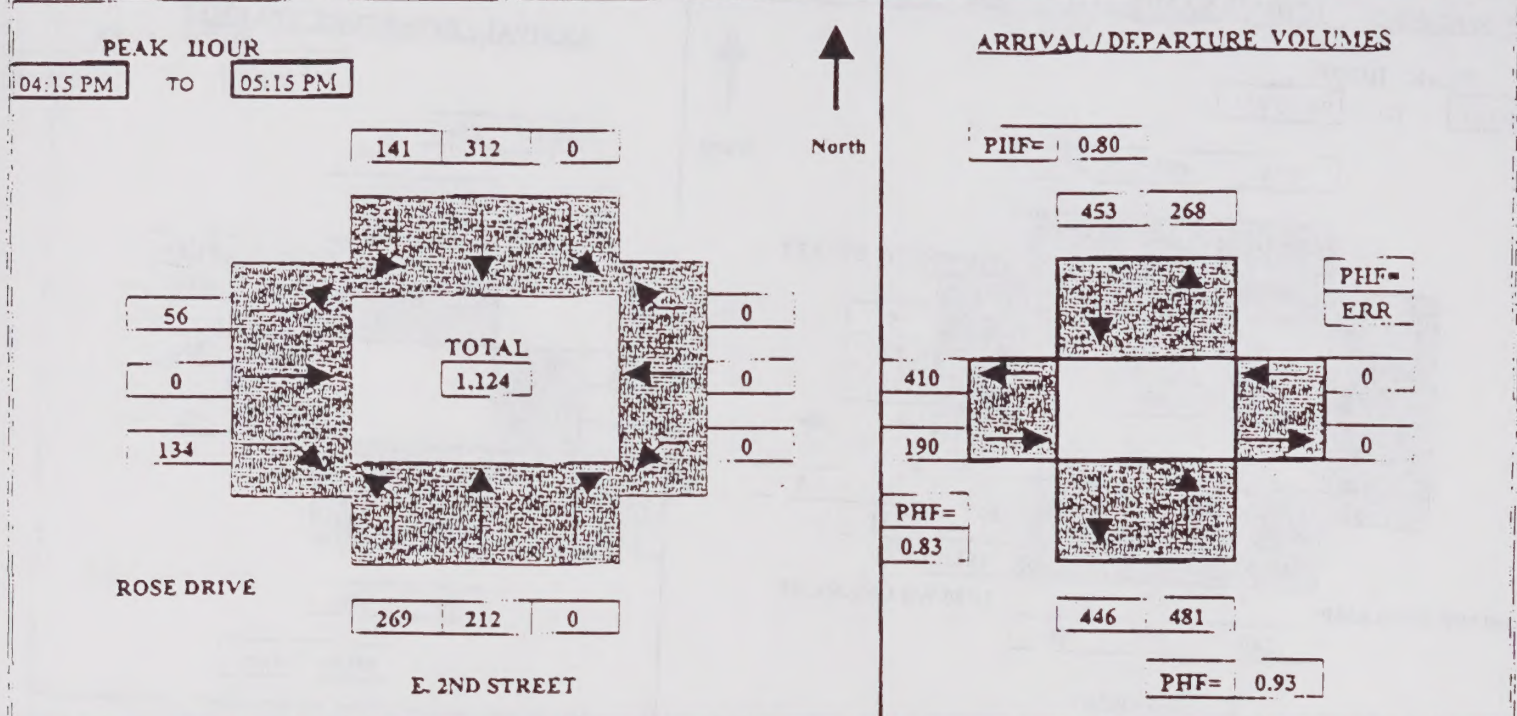
TIME PERIOD			NORTHBOUND			SOUTHBOUND			I-780 WB RAMPS			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
04:00 PM	---	04:15 PM	80	79	4	1	92	41	34	46	2	0	4	0	383
04:15 PM	---	04:30 PM	136	165	10	2	199	97	65	97	5	2	6	1	785
04:30 PM	---	04:45 PM	181	278	17	3	299	159	107	140	10	3	8	2	1,207
04:45 PM	---	05:00 PM	232	381	22	3	411	212	145	178	14	5	9	3	1,615
05:00 PM	---	05:15 PM	294	478	33	3	538	254	191	210	16	5	12	5	2,039
05:15 PM	---	05:30 PM	344	584	42	4	671	304	225	246	19	9	13	7	2,468
05:30 PM	---	05:45 PM	412	677	56	5	786	347	270	280	22	13	16	7	2,891
05:45 PM	---	06:00 PM	472	776	73	5	900	386	311	309	23	17	21	8	3,301

TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	80	79	4	1	92	41	34	46	2	0	4	0	383
04:15 PM	---	04:30 PM	56	86	6	1	107	56	31	51	3	2	2	1	402
04:30 PM	---	04:45 PM	45	113	7	1	100	62	42	43	5	1	2	1	422
04:45 PM	---	05:00 PM	51	103	5	0	112	53	38	38	4	2	1	1	408
05:00 PM	---	05:15 PM	62	97	11	0	127	42	46	32	2	0	3	2	424
05:15 PM	---	05:30 PM	50	106	9	1	133	50	34	36	3	4	1	2	429
05:30 PM	---	05:45 PM	68	93	14	1	115	43	45	34	3	4	3	0	423
05:45 PM	---	06:00 PM	60	99	17	0	114	39	41	29	1	4	5	1	410

HOURLY TOTALS															
04:00 PM	---	05:00 PM	232	381	22	3	411	212	145	178	14	5	9	3	1,615
04:15 PM	---	05:15 PM	214	399	29	2	446	213	157	164	14	5	8	5	1,656
04:30 PM	---	05:30 PM	208	419	32	2	472	207	160	149	14	7	7	6	1,683
04:45 PM	---	05:45 PM	231	399	39	2	487	188	163	140	12	10	8	5	1,684
05:00 PM	---	06:00 PM	240	395	51	2	489	174	166	131	9	12	12	5	1,686

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT: BENICIA TMC SURVEY DATE: 5/19/99 DAY: WEDNESDAY
 N-S Approach: E. 2ND STREET SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: ROSE DRIVE CITY: BENICIA FILE NAME: 7PM



TIME PERIOD		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	

SURVEY DATA															
04:00 PM	---	04:15 PM	46	41	0	0	73	32	12	0	28	0	0	0	232
04:15 PM	---	04:30 PM	105	95	0	0	155	60	22	0	62	0	0	0	499
04:30 PM	---	04:45 PM	178	152	0	0	209	94	37	0	89	0	0	0	759
04:45 PM	---	05:00 PM	239	201	0	0	281	136	54	0	129	0	0	0	1,040
05:00 PM	---	05:15 PM	315	253	0	0	385	173	68	0	162	0	0	0	1,356
05:15 PM	---	05:30 PM	397	283	0	0	460	203	79	0	191	0	0	0	1,613
05:30 PM	---	05:45 PM	469	316	0	0	524	228	95	0	226	0	0	0	1,858
05:45 PM	---	06:00 PM	546	343	0	0	576	248	108	0	257	0	0	0	2,078

TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	46	41	0	0	73	32	12	0	28	0	0	0	232
04:15 PM	---	04:30 PM	59	54	0	0	82	28	10	0	34	0	0	0	267
04:30 PM	---	04:45 PM	73	57	0	0	54	34	15	0	27	0	0	0	260
04:45 PM	---	05:00 PM	61	49	0	0	72	42	17	0	40	0	0	0	281
05:00 PM	---	05:15 PM	76	52	0	0	104	37	14	0	33	0	0	0	316
05:15 PM	---	05:30 PM	82	30	0	0	75	30	11	0	29	0	0	0	257
05:30 PM	---	05:45 PM	72	33	0	0	64	25	16	0	35	0	0	0	245
05:45 PM	---	06:00 PM	77	27	0	0	52	20	13	0	31	0	0	0	220

HOURLY TOTALS															
04:00 PM	---	05:00 PM	239	201	0	0	281	136	54	0	129	0	0	0	1,040
04:15 PM	---	05:15 PM	269	212	0	0	312	141	56	0	134	0	0	0	1,124
04:30 PM	---	05:30 PM	292	188	0	0	305	143	57	0	129	0	0	0	1,114
04:45 PM	---	05:45 PM	291	164	0	0	315	134	58	0	137	0	0	0	1,099
05:00 PM	---	06:00 PM	307	142	0	0	295	112	54	0	128	0	0	0	1,038

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: E. 2ND STREET SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: INDUSTRIAL WAY CITY: BENICIA FILE NAME: 10PM

PEAK HOUR

04:30 PM TO 05:30 PM



North

ARRIVAL / DEPARTURE VOLUMES

PHF= 0.80

363 255

PHF= 0.93

PHF= 0.70

PHF= 0.87

INDUSTRIAL WAY

E. 2ND STREET

TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
04:00 PM	---	04:15 PM	1	34	18	4	88	0	0	3	0	20	2	17	187
04:15 PM	---	04:30 PM	2	75	35	10	174	0	2	5	1	36	6	39	385
04:30 PM	---	04:45 PM	2	124	59	17	236	0	3	8	5	65	7	67	593
04:45 PM	---	05:00 PM	4	167	86	28	313	1	5	13	10	99	10	87	823
05:00 PM	---	05:15 PM	5	206	107	36	418	1	6	15	12	125	15	111	1,057
05:15 PM	---	05:30 PM	5	236	125	44	501	2	8	19	20	147	23	127	1,257
05:30 PM	---	05:45 PM	7	263	139	53	555	2	10	21	25	168	27	139	1,409
05:45 PM	---	06:00 PM	7	289	156	59	612	2	11	24	29	185	32	154	1,560

TOTAL BY PERIOD

04:00 PM	04:15 PM	1	34	18	4	88	0	0	3	0	20	2	17	187
04:15 PM	04:30 PM	1	41	17	6	86	0	2	2	1	16	4	22	198
04:30 PM	04:45 PM	0	49	24	7	62	0	1	3	4	29	1	28	208
04:45 PM	05:00 PM	2	43	27	11	77	1	2	5	5	34	3	20	230
05:00 PM	05:15 PM	1	39	21	8	105	0	1	2	2	26	5	24	234
05:15 PM	05:30 PM	0	30	18	8	83	1	2	4	8	22	8	16	200
05:30 PM	05:45 PM	2	27	14	9	54	0	2	2	5	21	4	12	152
05:45 PM	06:00 PM	0	26	17	6	57	0	1	3	4	17	5	15	151

HOURLY TOTALS

04:00 PM	05:00 PM	4	167	86	28	313	1	5	13	10	99	10	87	823
04:15 PM	05:15 PM	4	172	89	32	330	1	6	12	12	105	13	94	870
04:30 PM	05:30 PM	3	161	90	34	327	2	6	14	19	111	17	88	872
04:45 PM	05:45 PM	5	139	80	36	319	2	7	13	20	103	20	72	816
05:00 PM	06:00 PM	3	122	70	31	299	1	6	11	19	86	22	67	737

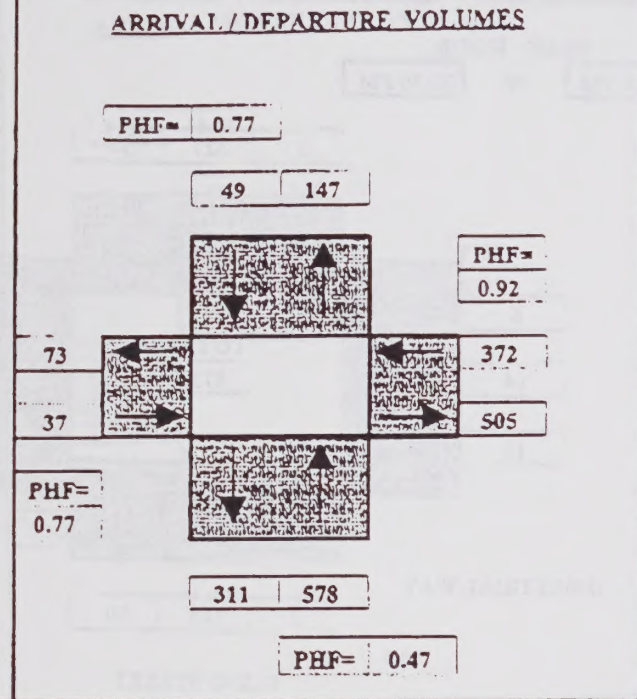
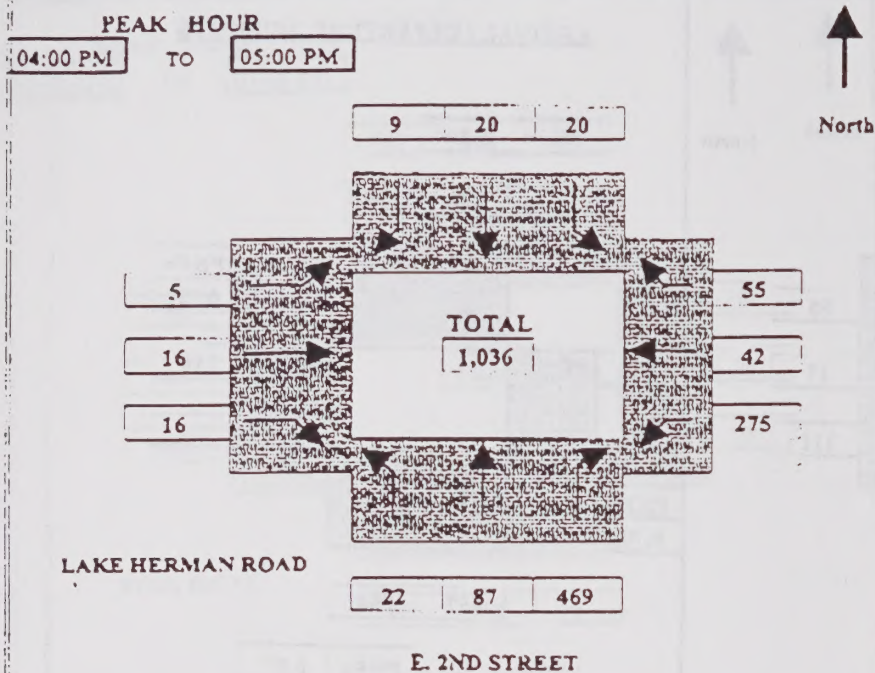
Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: E. 2ND STREET SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: LAKE HERMAN ROAD CITY: BENICIA FILE NAME: 17PM



TIME PERIOD		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	

SURVEY DATA

04:00 PM	---	04:15 PM	4	22	118	3	4	4	1	4	3	74	10	9	256
04:15 PM	---	04:30 PM	10	48	240	7	9	6	3	7	5	155	18	21	529
04:30 PM	---	04:45 PM	17	67	340	12	15	6	3	12	12	223	33	36	776
04:45 PM	---	05:00 PM	22	87	469	20	20	9	5	16	16	275	42	55	1,036
05:00 PM	---	05:15 PM	30	101	570	26	24	10	7	18	20	344	54	70	1,274
05:15 PM	---	05:30 PM	41	118	669	30	32	12	7	21	23	398	61	88	1,500
05:30 PM	---	05:45 PM	49	131	766	37	38	12	8	25	28	466	71	102	1,733
05:45 PM	---	06:00 PM	56	143	853	42	43	15	10	26	32	515	80	118	1,933

TOTAL BY PERIOD

04:00 PM	---	04:15 PM	4	22	118	3	4	4	1	4	3	74	10	9	256
04:15 PM	---	04:30 PM	6	26	122	4	5	2	2	3	2	81	8	12	273
04:30 PM	---	04:45 PM	7	19	100	5	6	0	0	5	7	68	15	15	247
04:45 PM	---	05:00 PM	5	20	129	8	5	3	2	4	4	52	9	19	260
05:00 PM	---	05:15 PM	8	14	101	6	4	1	2	2	4	69	12	15	238
05:15 PM	---	05:30 PM	11	17	99	4	8	2	0	3	3	54	7	18	226
05:30 PM	---	05:45 PM	8	13	97	7	6	0	1	4	5	68	10	14	233
05:45 PM	---	06:00 PM	7	12	87	5	5	3	2	1	4	49	9	16	200

HOURLY TOTALS

04:00 PM	---	05:00 PM	22	87	469	20	20	9	5	16	16	275	42	55	1,036
04:15 PM	---	05:15 PM	26	79	452	23	20	6	6	14	17	270	44	61	1,018
04:30 PM	---	05:30 PM	31	70	429	23	23	6	4	14	18	243	43	67	971
04:45 PM	---	05:45 PM	32	64	426	25	23	6	5	13	16	243	38	66	957
05:00 PM	---	06:00 PM	34	56	384	22	23	6	5	10	16	240	38	63	897

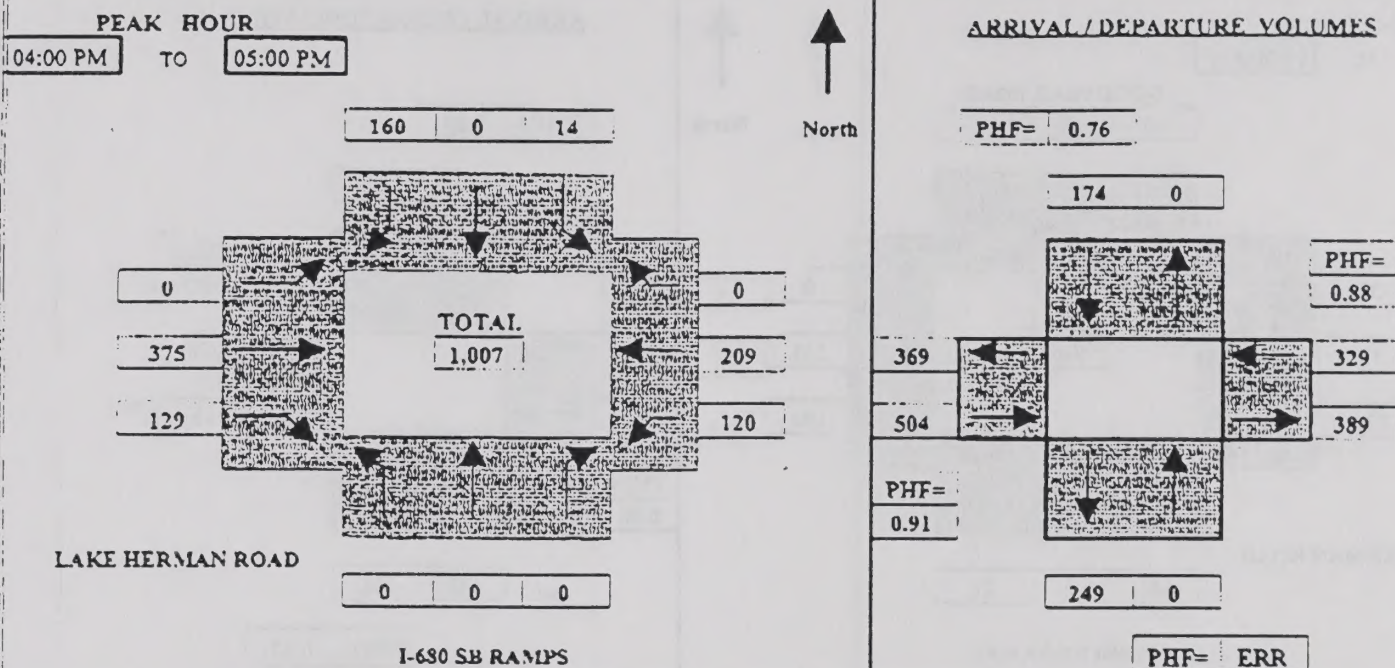
Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: I-680 SB RAMPS SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: LAKE HERMAN ROAD CITY: BENICIA FILE NAME: 18PM



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
			From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	
SURVEY DATA															
04:00 PM	---	04:15 PM	0	0	0	3	0	34	0	89	38	26	59	0	249
04:15 PM	---	04:30 PM	0	0	0	5	0	75	0	189	70	57	116	0	512
04:30 PM	---	04:45 PM	0	0	0	9	0	120	0	270	96	94	172	0	761
04:45 PM	---	05:00 PM	0	0	0	14	0	160	0	375	129	120	209	0	1,007
05:00 PM	---	05:15 PM	0	0	0	19	0	212	0	457	157	138	261	0	1,244
05:15 PM	---	05:30 PM	0	0	0	23	0	255	0	533	189	158	292	0	1,450
05:30 PM	---	05:45 PM	0	0	0	26	0	292	0	617	215	172	354	0	1,676
05:45 PM	---	06:00 PM	0	0	0	31	0	327	0	694	237	189	388	0	1,866

TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	0	0	0	3	0	34	0	89	38	26	59	0	249
04:15 PM	---	04:30 PM	0	0	0	2	0	41	0	100	32	31	57	0	263
04:30 PM	---	04:45 PM	0	0	0	4	0	45	0	81	26	37	56	0	249
04:45 PM	---	05:00 PM	0	0	0	5	0	40	0	105	33	26	37	0	246
05:00 PM	---	05:15 PM	0	0	0	5	0	52	0	82	28	13	52	0	237
05:15 PM	---	05:30 PM	0	0	0	4	0	43	0	76	32	20	31	0	206
05:30 PM	---	05:45 PM	0	0	0	3	0	37	0	84	26	14	62	0	226
05:45 PM	---	06:00 PM	0	0	0	5	0	35	0	77	22	17	34	0	190

HOURLY TOTALS															
04:00 PM	---	05:00 PM	0	0	0	14	0	160	0	375	129	120	209	0	1,007
04:15 PM	---	05:15 PM	0	0	0	16	0	178	0	368	119	112	202	0	995
04:30 PM	---	05:30 PM	0	0	0	18	0	180	0	344	119	101	176	0	938
04:45 PM	---	05:45 PM	0	0	0	17	0	172	0	347	119	78	182	0	915
05:00 PM	---	06:00 PM	0	0	0	17	0	167	0	319	108	69	179	0	859

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC

SURVEY DATE: 5/20/99

DAY: THURSDAY

N-S Approach: I-680 NB RAMPS

SURVEY TIME: 4:00 PM TO 6:00 PM

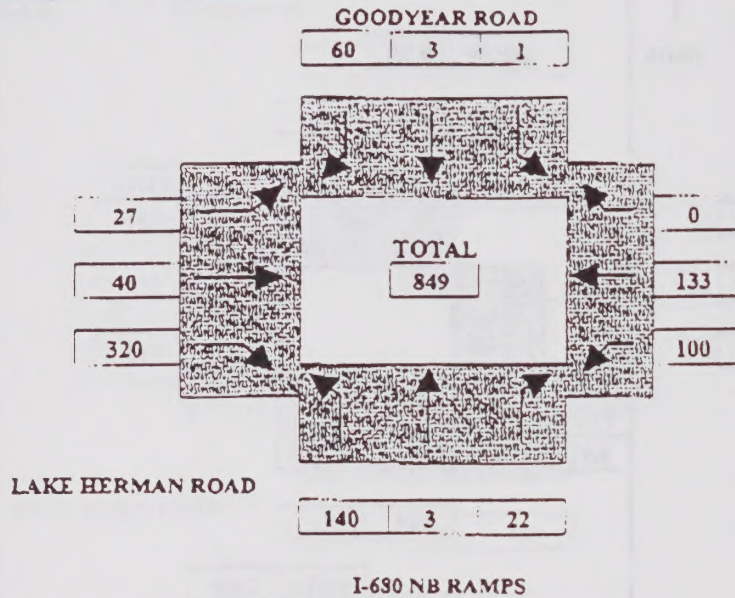
E-W Approach: LAKE HERMAN ROAD

CITY: BENICIA

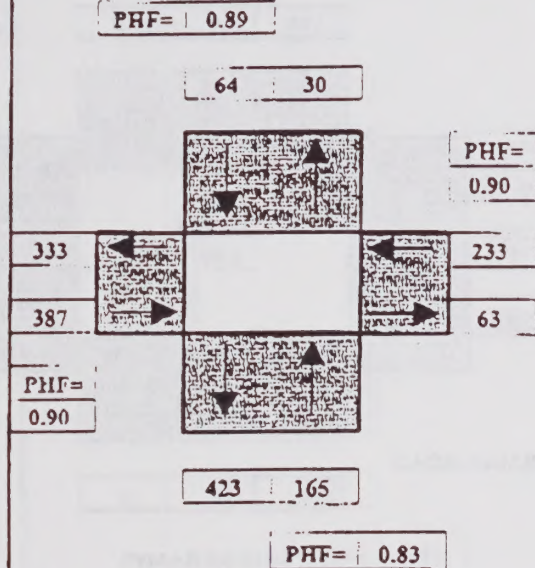
FILE NAME: 19PM

PEAK HOUR

04:00 PM TO 05:00 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
			From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	
SURVEY DATA															
04:00 PM	--	04:15 PM	35	0	6	0	0	16	4	10	76	17	31	0	195
04:15 PM	---	04:30 PM	77	1	13	0	0	34	11	19	161	43	63	0	422
04:30 PM	--	04:45 PM	114	3	17	0	2	45	17	27	236	63	105	0	629
04:45 PM	---	05:00 PM	140	3	22	1	3	60	27	40	320	100	133	0	849
05:00 PM	---	05:15 PM	161	5	25	1	3	69	36	48	389	130	167	0	1,034
05:15 PM	---	05:30 PM	179	5	29	1	5	81	44	54	461	156	193	0	1,208
05:30 PM	---	05:45 PM	204	7	35	1	5	95	55	63	529	177	222	0	1,393
05:45 PM	---	06:00 PM	224	8	39	1	5	104	63	70	595	205	247	0	1,561
TOTAL BY PERIOD															
04:00 PM	--	04:15 PM	35	0	6	0	0	16	4	10	76	17	31	0	195
04:15 PM	---	04:30 PM	42	1	7	0	0	18	7	9	85	26	32	0	227
04:30 PM	---	04:45 PM	37	2	4	0	2	11	6	8	75	20	42	0	207
04:45 PM	---	05:00 PM	26	0	5	1	1	15	10	13	84	37	28	0	220
05:00 PM	---	05:15 PM	21	2	3	0	0	9	9	8	69	30	34	0	185
05:15 PM	---	05:30 PM	18	0	4	0	2	12	8	6	72	26	26	0	174
05:30 PM	---	05:45 PM	25	2	6	0	0	14	11	9	68	21	29	0	185
05:45 PM	---	06:00 PM	20	1	4	0	0	9	8	7	66	28	25	0	168
HOURLY TOTALS															
04:00 PM	---	05:00 PM	140	3	22	1	3	60	27	40	320	100	133	0	849
04:15 PM	---	05:15 PM	126	5	19	1	3	53	32	38	313	113	136	0	839
04:30 PM	---	05:30 PM	102	4	16	1	5	47	33	35	300	113	130	0	786
04:45 PM	---	05:45 PM	90	4	13	1	3	50	38	36	293	114	117	0	764
05:00 PM	---	06:00 PM	84	5	17	0	2	44	36	30	275	105	114	0	712
Contra Costa County: (510) 232-1271			SF/Peninsula: (415) 750-1317						Alameda County: (510) 233-2292						

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC

SURVEY DATE: 5/20/99

DAY: THURSDAY

N-S Approach: PARK ROAD

SURVEY TIME: 4:00 PM TO 6:00 PM

E-W Approach: INDUSTRIAL WAY

CITY: BENICIA

FILE NAME: 14PM

PEAK HOUR

04:00 PM TO 05:00 PM



North

ARRIVAL / DEPARTURE VOLUMES

PHF= 0.39

154 112

PHF= 0.88

162

169

269

216

PHF= 0.91

373 271

PHF= 0.95

INDUSTRIAL WAY

111 64 96

PARK ROAD

TOTAL
863

TIME PERIOD

NORTHBOUND

SOUTHBOUND

EASTBOUND

WESTBOUND

From To Left Thru Right Left Thru Right Left Thru Right Left Thru Right TOTAL

SURVEY DATA

04:00 PM	---	04:15 PM	24	22	23	4	16	10	12	30	32	35	8	2	218
04:15 PM	---	04:30 PM	53	37	50	9	41	15	22	56	69	73	15	5	445
04:30 PM	---	04:45 PM	79	53	72	16	79	19	30	78	95	102	21	10	654
04:45 PM	---	05:00 PM	111	64	96	22	110	22	36	98	135	128	29	12	863
05:00 PM	---	05:15 PM	136	74	114	26	139	24	40	113	170	147	40	16	1,039
05:15 PM	---	05:30 PM	156	91	135	32	181	25	45	126	199	171	47	25	1,233
05:30 PM	---	05:45 PM	174	103	151	37	216	28	49	141	224	187	57	34	1,401
05:45 PM	---	06:00 PM	188	118	165	39	248	29	52	152	244	199	65	40	1,539

TOTAL BY PERIOD

04:00 PM	---	04:15 PM	24	22	23	4	16	10	12	30	32	35	8	2	218
04:15 PM	---	04:30 PM	29	15	27	5	25	5	10	26	37	38	7	3	227
04:30 PM	---	04:45 PM	26	16	22	7	38	4	8	22	26	29	6	5	209
04:45 PM	---	05:00 PM	32	11	24	6	31	3	6	20	40	26	8	2	209
05:00 PM	---	05:15 PM	25	10	18	4	29	2	4	15	35	19	11	4	176
05:15 PM	---	05:30 PM	20	17	21	6	42	1	5	13	29	24	7	9	194
05:30 PM	---	05:45 PM	18	12	16	5	35	3	4	15	25	16	10	9	168
05:45 PM	---	06:00 PM	14	15	14	2	32	1	3	11	20	12	8	6	138

HOURLY TOTALS

04:00 PM	---	05:00 PM	111	64	96	22	110	22	36	98	135	128	29	12	863
04:15 PM	---	05:15 PM	112	52	91	22	123	14	28	83	138	112	32	14	821
04:30 PM	---	05:30 PM	103	54	85	23	140	10	23	70	130	98	32	20	788
04:45 PM	---	05:45 PM	95	50	79	21	137	9	19	63	129	85	36	24	747
05:00 PM	---	06:00 PM	77	54	69	17	138	7	16	54	109	71	36	28	676

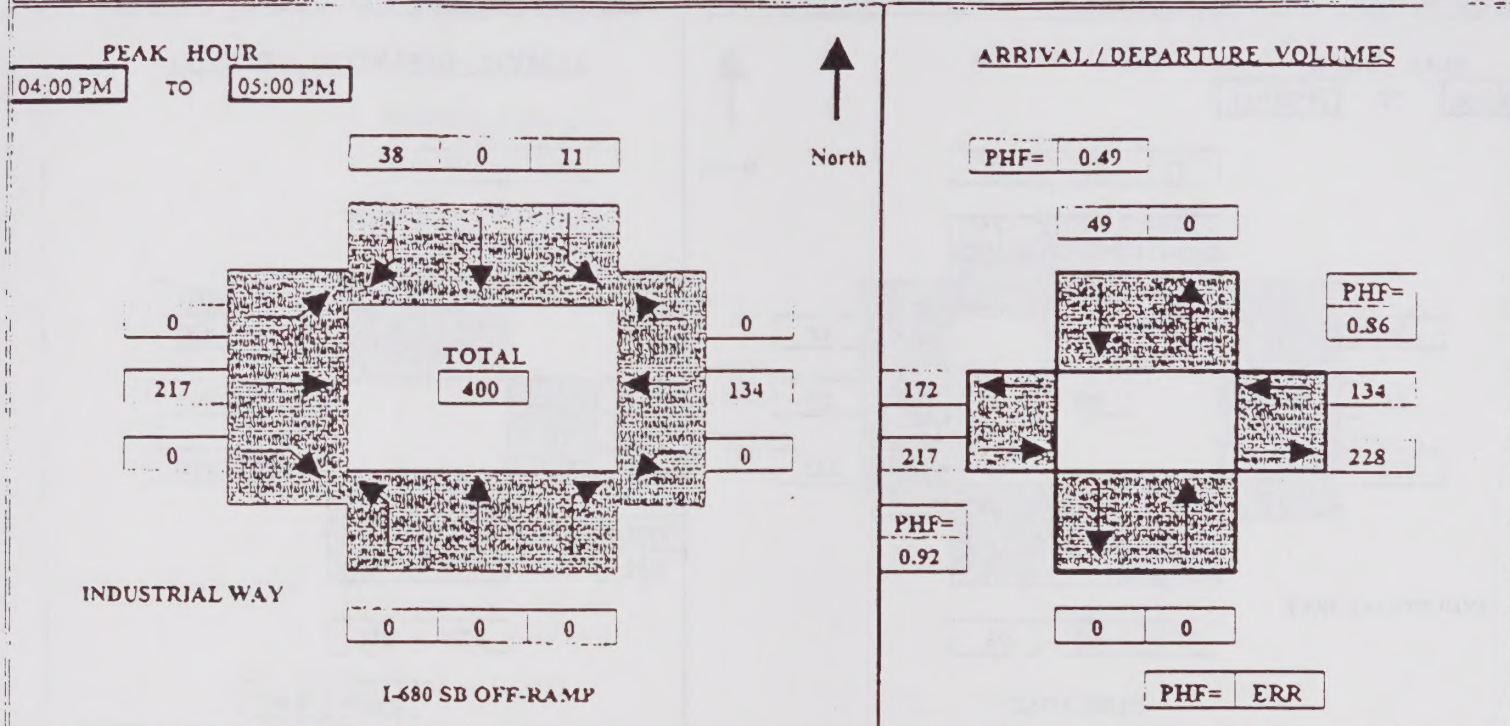
Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES**INTERSECTION TURNING MOVEMENT SUMMARY**

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: I-680 SB OFF-RAMP SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: INDUSTRIAL WAY CITY: BENICIA FILE NAME: 15PM



TIME PERIOD		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	

SURVEY DATA															
04:00 PM	---	04:15 PM	0	0	0	2	0	6	0	59	0	0	37	0	104
04:15 PM	---	04:30 PM	0	0	0	5	0	15	0	116	0	0	76	0	212
04:30 PM	---	04:45 PM	0	0	0	7	0	28	0	164	0	0	103	0	302
04:45 PM	---	05:00 PM	0	0	0	11	0	38	0	217	0	0	134	0	400
05:00 PM	---	05:15 PM	0	0	0	13	0	55	0	253	0	0	152	0	473
05:15 PM	---	05:30 PM	0	0	0	19	0	69	0	291	0	0	175	0	554
05:30 PM	---	05:45 PM	0	0	0	24	0	89	0	326	0	0	189	0	628
05:45 PM	---	06:00 PM	0	0	0	27	0	105	0	352	0	0	200	0	684

TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	0	0	0	2	0	6	0	59	0	0	37	0	104
04:15 PM	---	04:30 PM	0	0	0	3	0	9	0	57	0	0	39	0	108
04:30 PM	---	04:45 PM	0	0	0	2	0	13	0	48	0	0	27	0	90
04:45 PM	---	05:00 PM	0	0	0	4	0	10	0	53	0	0	31	0	98
05:00 PM	---	05:15 PM	0	0	0	2	0	17	0	36	0	0	18	0	73
05:15 PM	---	05:30 PM	0	0	0	6	0	14	0	38	0	0	23	0	81
05:30 PM	---	05:45 PM	0	0	0	5	0	20	0	35	0	0	14	0	74
05:45 PM	---	06:00 PM	0	0	0	3	0	16	0	26	0	0	11	0	56

HOURLY TOTALS															
04:00 PM	---	05:00 PM	0	0	0	11	0	38	0	217	0	0	134	0	400
04:15 PM	---	05:15 PM	0	0	0	11	0	49	0	194	0	0	115	0	369
04:30 PM	---	05:30 PM	0	0	0	14	0	54	0	175	0	0	99	0	342
04:45 PM	---	05:45 PM	0	0	0	17	0	61	0	162	0	0	86	0	326
05:00 PM	---	06:00 PM	0	0	0	16	0	67	0	135	0	0	66	0	284

Contra Costa County: (510) 232-1271

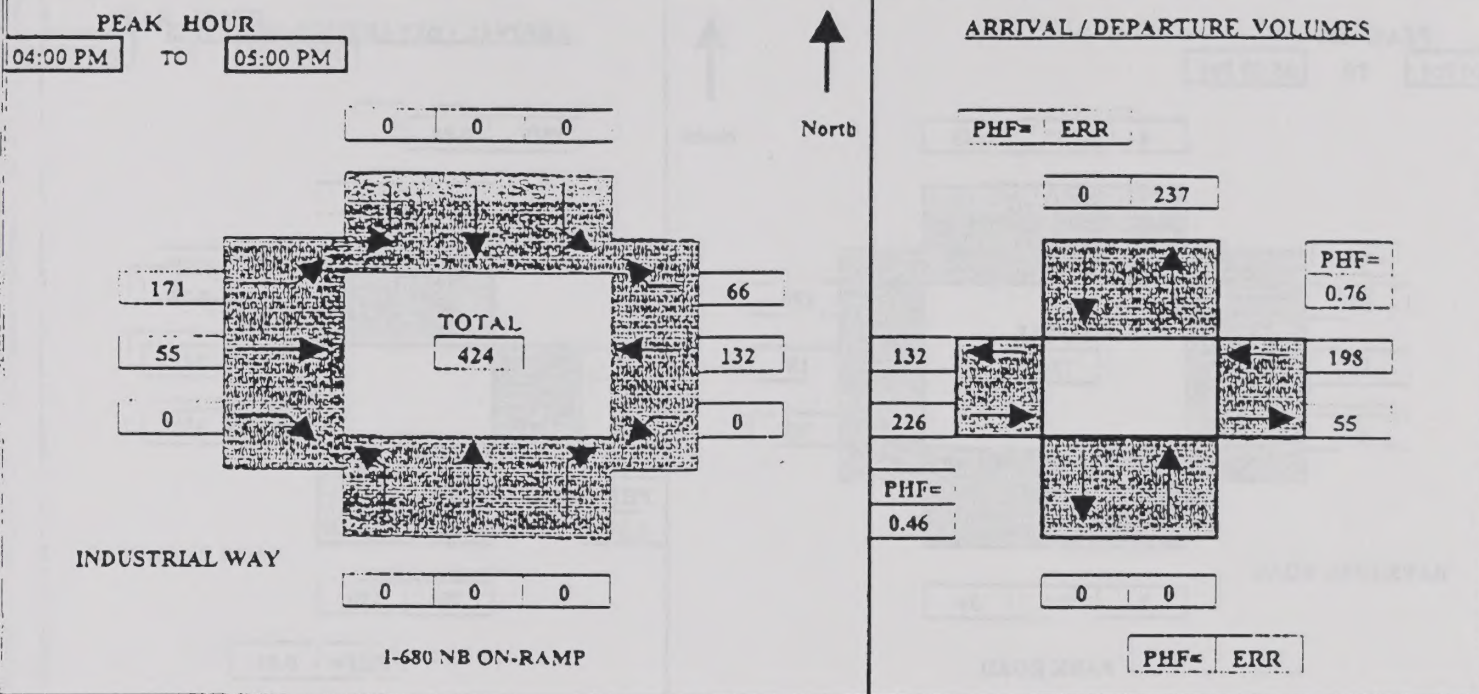
SF/Peninsula: (415) 750-1317

Alameda County: (510) 253-2292

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: I-680 NB ON-RAMP SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: INDUSTRIAL WAY CITY: BENICIA FILE NAME: 16PM



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
From		To	SURVEY DATA												
04:00 PM	---	04:15 PM	0	0	0	0	0	0	43	18	0	0	37	20	118
04:15 PM	---	04:30 PM	0	0	0	0	0	0	89	33	0	0	77	45	244
04:30 PM	---	04:45 PM	0	0	0	0	0	0	126	43	0	0	103	58	330
04:45 PM	---	05:00 PM	0	0	0	0	0	0	171	55	0	0	132	66	424
05:00 PM	---	05:15 PM	0	0	0	0	0	0	194	72	0	0	153	82	501
05:15 PM	---	05:30 PM	0	0	0	0	0	0	223	85	0	0	175	92	575
05:30 PM	---	05:45 PM	0	0	0	0	0	0	245	106	0	0	189	110	650
05:45 PM	---	06:00 PM	0	0	0	0	0	0	257	122	0	0	201	124	704

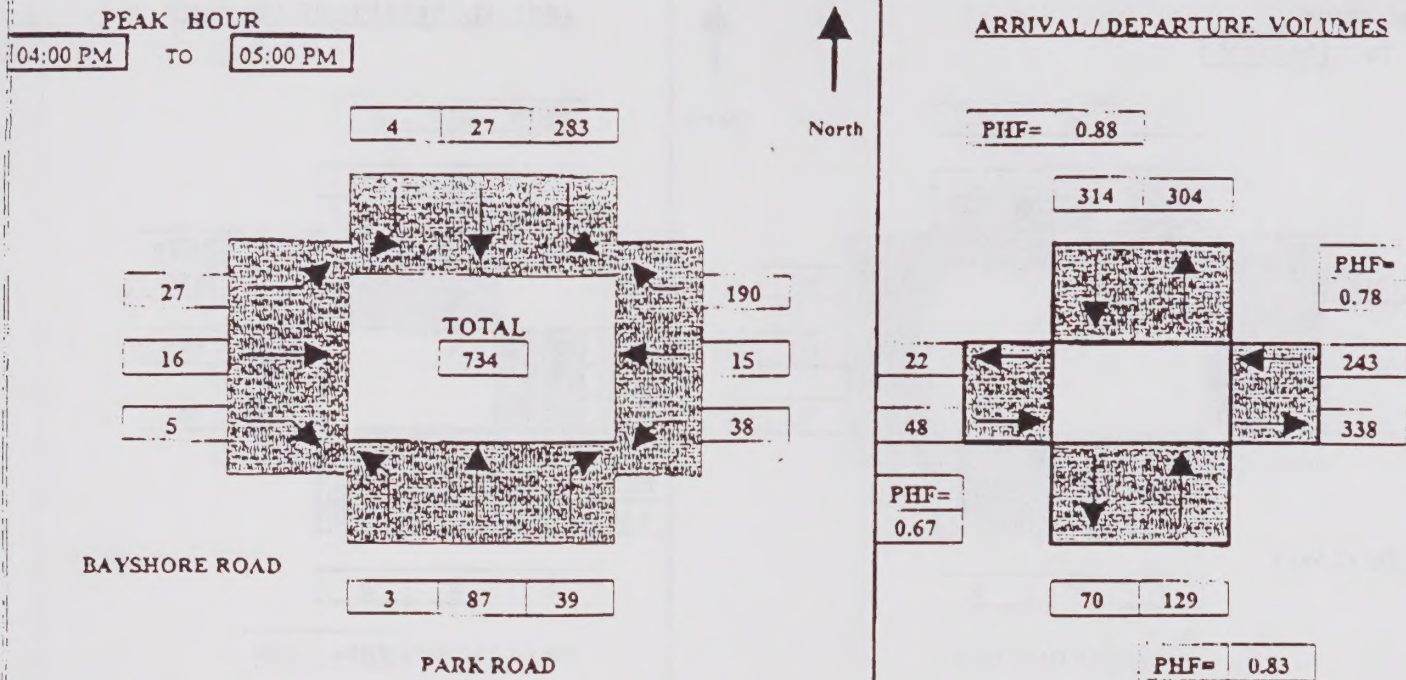
TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	0	0	0	0	0	0	43	18	0	0	37	20	118
04:15 PM	---	04:30 PM	0	0	0	0	0	0	46	15	0	0	40	25	126
04:30 PM	---	04:45 PM	0	0	0	0	0	0	37	10	0	0	26	13	86
04:45 PM	---	05:00 PM	0	0	0	0	0	0	45	12	0	0	29	8	94
05:00 PM	---	05:15 PM	0	0	0	0	0	0	23	17	0	0	21	16	77
05:15 PM	---	05:30 PM	0	0	0	0	0	0	29	13	0	0	22	10	74
05:30 PM	---	05:45 PM	0	0	0	0	0	0	22	21	0	0	14	18	75
05:45 PM	---	06:00 PM	0	0	0	0	0	0	12	16	0	0	12	14	54

HOURLY TOTALS															
04:00 PM	---	05:00 PM	0	0	0	0	0	0	171	55	0	0	132	66	424
04:15 PM	---	05:15 PM	0	0	0	0	0	0	151	54	0	0	116	62	383
04:30 PM	---	05:30 PM	0	0	0	0	0	0	134	52	0	0	98	47	331
04:45 PM	---	05:45 PM	0	0	0	0	0	0	119	63	0	0	86	52	320
05:00 PM	---	06:00 PM	0	0	0	0	0	0	86	67	0	0	69	58	280

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: PARK ROAD SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: BAYSHORE ROAD CITY: BENICIA FILE NAME: 11PM



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
SURVEY DATA															
04:00 PM	---	04:15 PM	0	12	14	70	8	2	12	6	0	8	9	61	202
04:15 PM	---	04:30 PM	1	31	24	154	13	2	20	8	3	17	12	116	401
04:30 PM	---	04:45 PM	1	61	33	223	21	3	25	13	3	27	12	156	578
04:45 PM	---	05:00 PM	3	87	39	283	27	4	27	16	5	38	15	190	734
05:00 PM	---	05:15 PM	4	102	52	355	36	7	31	18	5	44	16	235	905
05:15 PM	---	05:30 PM	4	122	62	416	43	7	32	22	6	49	16	267	1,046
05:30 PM	---	05:45 PM	5	135	70	468	53	9	34	24	7	52	19	295	1,171
05:45 PM	---	06:00 PM	5	152	79	524	61	9	39	25	7	57	19	326	1,303

TOTAL BY PERIOD														
04:00 PM	04:15 PM	0	12	14	70	8	2	12	6	0	8	9	61	202
04:15 PM	04:30 PM	1	19	10	84	5	0	8	2	3	9	3	55	199
04:30 PM	04:45 PM	0	30	9	69	8	1	5	5	0	10	0	40	177
04:45 PM	05:00 PM	2	26	6	60	6	1	2	3	2	11	3	34	156
05:00 PM	05:15 PM	1	15	13	72	9	3	4	2	0	6	1	45	171
05:15 PM	05:30 PM	0	20	10	61	7	0	1	4	1	5	0	32	141
05:30 PM	05:45 PM	1	13	8	52	10	2	2	2	1	3	3	28	125
05:45 PM	06:00 PM	0	17	9	56	8	0	5	1	0	5	0	31	132

HOURLY TOTALS														
04:00 PM	05:00 PM	3	87	39	283	27	4	27	16	5	38	15	190	734
04:15 PM	05:15 PM	4	90	38	285	28	5	19	12	5	36	7	174	703
04:30 PM	05:30 PM	3	91	38	262	30	5	12	14	3	32	4	151	645
04:45 PM	05:45 PM	4	74	37	245	32	6	9	11	4	25	7	139	593
05:00 PM	06:00 PM	2	65	40	241	34	5	12	9	2	19	4	136	569

Contra Costa County: (510) 232-1271

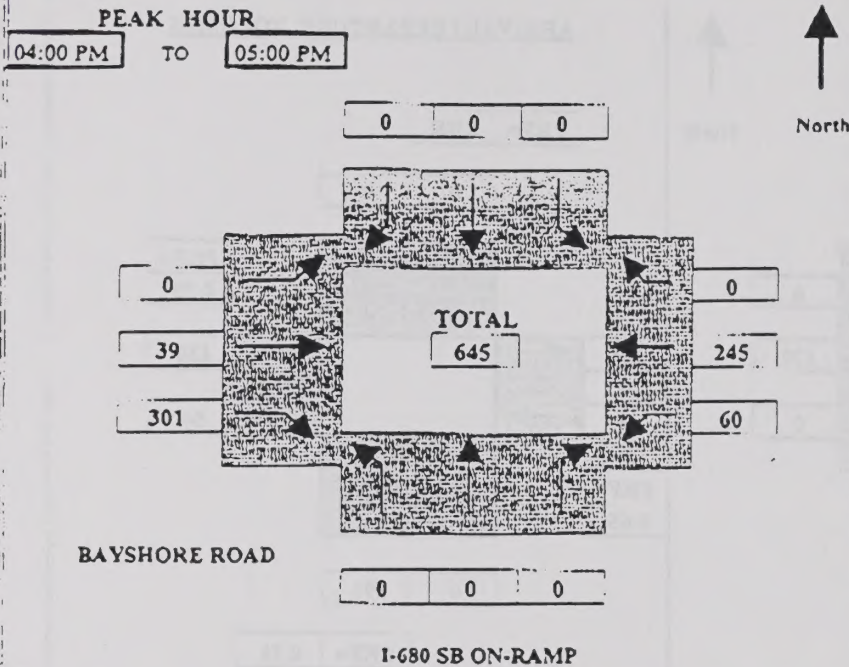
SF/Peninsula: (415) 750-1317

Alameda County: (510) 233-2292

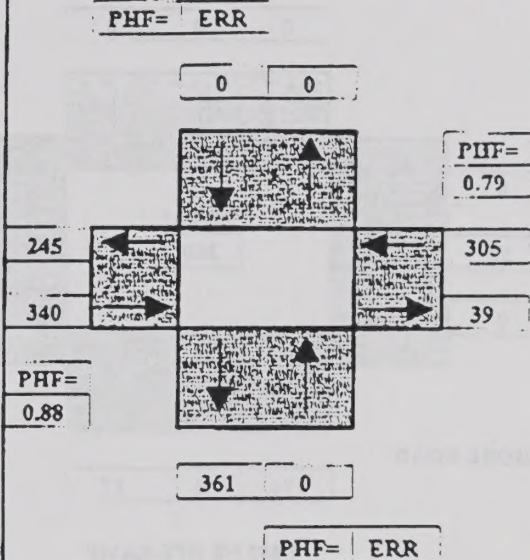
BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: BENICIA TMC SURVEY DATE: 5/20/99 DAY: THURSDAY
 N-S Approach: 1-680 SB ON-RAMP SURVEY TIME: 4:00 PM TO 6:00 PM
 E-W Approach: BAYSHORE ROAD CITY: BENICIA FILE NAME: 12PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
			From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	
SURVEY DATA															
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	14	78	18	79	0	189
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	23	166	33	147	0	369
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	33	232	49	192	0	506
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	39	301	60	245	0	645
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	47	381	67	296	0	791
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	52	446	76	330	0	904
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	56	509	84	369	0	1,018
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	63	563	91	400	0	1,117

TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	14	78	18	79	0	189
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	9	88	15	68	0	180
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	10	66	16	45	0	137
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	6	69	11	53	0	139
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	8	80	7	51	0	146
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	5	65	9	34	0	113
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	4	63	8	39	0	114
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	7	54	7	31	0	99

HOURLY TOTALS															
04:00 PM	---	05:00 PM	0	0	0	0	0	0	0	39	301	60	245	0	645
04:15 PM	---	05:15 PM	0	0	0	0	0	0	0	33	303	49	217	0	602
04:30 PM	---	05:30 PM	0	0	0	0	0	0	0	29	280	43	183	0	535
04:45 PM	---	05:45 PM	0	0	0	0	0	0	0	23	277	35	177	0	512
05:00 PM	---	06:00 PM	0	0	0	0	0	0	0	24	262	31	155	0	472

Contra Costa County: (510) 232-1271

SF/Peninsula: (415) 750-1317

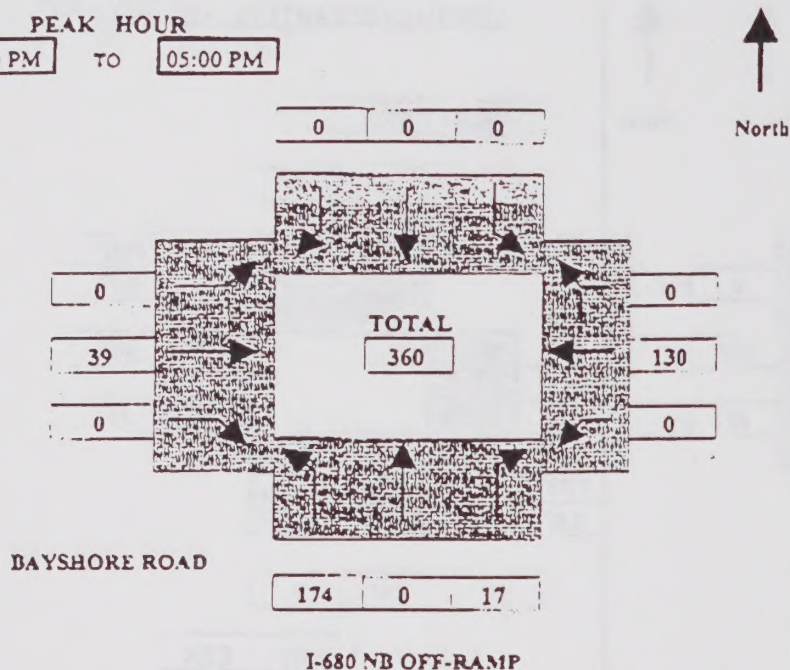
Alameda County: (510) 233-2292

BAYMETRICS TRAFFIC RESOURCES

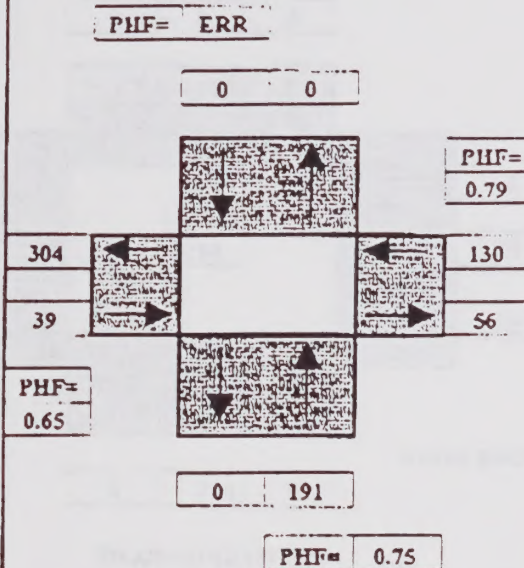
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	BENICIA TMC	SURVEY DATE:	5/20/99	DAY:	THURSDAY
N-S Approach:	I-680 NB OFF-RAMP	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W Approach:	BAYSHORE ROAD	CITY:	BENICIA	FILE NAME:	13PM

PEAK HOUR
04:00 PM TO 05:00 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
			From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	
SURVEY DATA															
04:00 PM	---	04:15 PM	58	0	6	0	0	0	0	15	0	0	41	0	120
04:15 PM	---	04:30 PM	106	0	10	0	0	0	0	23	0	0	75	0	214
04:30 PM	---	04:45 PM	146	0	15	0	0	0	0	34	0	0	97	0	292
04:45 PM	---	05:00 PM	174	0	17	0	0	0	0	39	0	0	130	0	360
05:00 PM	---	05:15 PM	209	0	24	0	0	0	0	47	0	0	156	0	436
05:15 PM	---	05:30 PM	235	0	27	0	0	0	0	52	0	0	172	0	486
05:30 PM	---	05:45 PM	255	0	33	0	0	0	0	56	0	0	196	0	540
05:45 PM	---	06:00 PM	272	0	35	0	0	0	0	62	0	0	219	0	588
TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	58	0	6	0	0	0	0	15	0	0	41	0	120
04:15 PM	---	04:30 PM	48	0	4	0	0	0	0	8	0	0	34	0	94
04:30 PM	---	04:45 PM	40	0	5	0	0	0	0	11	0	0	22	0	78
04:45 PM	---	05:00 PM	28	0	2	0	0	0	0	5	0	0	33	0	68
05:00 PM	---	05:15 PM	35	0	7	0	0	0	0	8	0	0	26	0	76
05:15 PM	---	05:30 PM	26	0	3	0	0	0	0	5	0	0	16	0	50
05:30 PM	---	05:45 PM	20	0	6	0	0	0	0	4	0	0	24	0	54
05:45 PM	---	06:00 PM	17	0	2	0	0	0	0	6	0	0	23	0	48
HOURLY TOTALS															
04:00 PM	---	05:00 PM	174	0	17	0	0	0	0	39	0	0	130	0	360
04:15 PM	---	05:15 PM	151	0	18	0	0	0	0	32	0	0	115	0	316
04:30 PM	---	05:30 PM	129	0	17	0	0	0	0	29	0	0	97	0	272
04:45 PM	---	05:45 PM	109	0	18	0	0	0	0	22	0	0	99	0	248
05:00 PM	---	06:00 PM	98	0	18	0	0	0	0	23	0	0	89	0	228
Contra Costa County: (510) 232-1271 SF/Peninsula: (415) 750-1317 Alameda County: (510) 233-2292															

EXISTING CONDITIONS LEVEL OF SERVICE ANALYSIS

Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I-780 EB RAMP S

Cycle (Sec):	100	Critical Vol./Cap. (%):	0.104
Loss Time (sec):	9 (YOR = 4 sec)	Average Delay (sec/veh):	19.7
Optimal Cycle:	60	Level Of Service:	C

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	T	R		L	T	R		L	T	R		L	T	R	
Control:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	20	20		5	30	0		0	0	0		15	0	15	
Lanes:	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0	

Volume Module:												
Base Vol:	0	312	126	264	302	0	0	0	0	185	0	271
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	312	126	264	302	0	0	0	0	185	0	271
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	312	126	264	302	0	0	0	0	185	0	271
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	328	133	278	318	0	0	0	0	195	0	285
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	328	133	278	318	0	0	0	0	195	0	285
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	328	133	278	318	0	0	0	0	195	0	285

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00	0.80	1.00	0.80
Lanes:	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.41	0.00	0.59
Final Sat.:	0	1900	1615	1805	1900	0	0	0	0	620	0	907

Capacity Analysis Module:												
Vol/Sat:	0.00	0.17	0.08	0.15	0.17	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Print Moves:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Green Time:	0.00	24.5	24.5	21.9	46.4	0.0	0.0	0.0	0.0	44.6	0.0	44.6
Volume/Cap:	0.00	0.70	0.34	0.70	0.36	0.00	0.00	0.00	0.00	0.70	0.00	0.70
Delay/Vol:	0.0	25.5	20.3	27.2	11.3	0.0	0.0	0.0	0.0	16.7	0.0	16.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjFuel/Vol:	0.0	25.5	20.3	27.2	11.3	0.0	0.0	0.0	0.0	16.7	0.0	16.7
DesignQueue:	0	14	6	13	10	0	0	0	0	6	0	6

Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 EAST SECOND / I-780 WB RAMPs

Average Delay (sec/veh) :	4.1	World Class Level Of Service:	F
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Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Uncontrolled	Uncontrolled	Stop Sign	Stop Sign
Rights:	Include	Include	Include	Include
Lanes:	1 0 1 0 0	1 0 1 0 1	0 0 0 0 0	1 0 0 0 1

Volume Module: >> Count Date: 19 May 1999 <<												
Base Vol:	180	335	0	0	432	158	0	0	0	103	0	153
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	180	335	0	0	432	158	0	0	0	103	0	153
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	180	335	0	0	432	158	0	0	0	103	0	153
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PIF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PIF Volume:	189	353	0	0	455	166	0	0	0	108	0	161
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol:	189	353	0	0	455	166	0	0	0	108	0	161
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Comb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol:	208	353	0	0	455	166	0	0	0	119	0	177

MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx		3.4	xxxx	2.6
Critical Gp:	5.9	xxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx		6.5	xxxx	5.2

Capacity Module:									
Cnflct Vol:	621	xxxx	xxxxx	xxxx	xxxx	xxxxxx	997	xxxx	353
Potent Cap.:	867	xxxx	xxxxx	xxxx	xxxx	xxxxxx	280	xxxx	918
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxxx	0.76	xxxx	1.00
Move Cap.:	867	xxxx	xxxxx	xxxx	xxxx	xxxxxx	213	xxxx	918

Level of Service Module:											
Stopped Del:	5.3	xxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	34.1	xxxx	4.8
LOS by Move:	B	*	*	*	*	*	*	*	E	*	A
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxxx
Shared LOS:	*	*	xxxxx	*	*	xxxxx	*	*	xxxxx	*	xxxxx
ApproachDel:	2.0			0.0			0.0			16.6	

Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #3 EAST SECOND / ROSE

Cycle (sec): 60 Critical Vol./Cap. (X): 0.415
Loss Time (sec): 9 (Y/R = 5 sec) Average Delay (sec/veh): 9.4
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	1	0	2	0	0	1	1	0	1	0	0	0

Volume Module: >> Count Date: 19 May 1999 <<
Base Vol: 100 242 0 0 230 39 149 0 358 0 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 100 242 0 0 230 39 149 0 358 0 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 100 242 0 0 230 39 149 0 358 0 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 100 242 0 0 230 39 149 0 358 0 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 100 242 0 0 230 39 149 0 358 0 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.05 1.00 1.00 1.05 1.05 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 100 254 0 0 242 41 149 0 358 0 0 0 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 1.00 0.98 0.98 0.95 1.00 0.85 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 1.71 0.29 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 1805 3800 0 0 3184 540 1805 0 1615 0 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.06 0.07 0.00 0.00 0.08 0.08 0.08 0.00 0.22 0.00 0.00 0.00
Crit Moves: ****
Green Time: 6.2 26.2 0.0 0.0 20.0 20.0 24.8 0.0 24.8 0.0 0.0 0.0
Volume/Cap: 0.54 0.15 0.00 0.00 0.23 0.23 0.20 0.00 0.54 0.00 0.00 0.00
Delay/Veh: 18.8 6.6 0.0 0.0 9.3 9.3 7.3 0.0 9.2 0.0 0.0 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 18.8 6.6 0.0 0.0 9.3 9.3 7.3 0.0 9.2 0.0 0.0 0.0
DesignQueue: 3 5 0 0 5 1 3 0 7 0 0 0 0

Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #4 EAST SECOND / INDUSTRIAL

Cycle (sec): 80 Critical Vol./Cap. (X): 0.760
Loss Time (sec): 9 (Y/R = 5 sec) Average Delay (sec/veh): 9.4
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	5	20	20	5	20	20	18	18	18	18	18	18
Lanes:	1	0	1	1	0	1	1	0	1	0	0	1

Volume Module:
Base Vol: 5 242 125 82 238 11 2 3 5 53 9 12
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 242 125 82 238 11 2 3 5 53 9 12
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 5 242 125 82 238 11 2 3 5 53 9 12
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 5 255 132 86 251 12 2 3 5 56 9 13
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 5 255 132 86 251 12 2 3 5 56 9 13
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 5 255 132 86 251 12 2 3 5 56 9 13

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.91 0.91 0.91 0.84 0.84 0.84
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.38 0.62 0.72 0.11 0.17
Final Sat.: 1805 1900 1615 1805 1900 1615 1729 648 1081 1140 181 265

Capacity Analysis Module:
Vol/Sat: 0.00 0.13 0.08 0.05 0.13 0.01 0.00 0.00 0.00 0.05 0.05 0.05
Crit Moves: ****
Green Time: 10.6 39.1 39.1 13.9 42.4 42.4 18.0 18.0 18.0 18.0 18.0 18.0
Volume/Cap: 0.02 0.27 0.17 0.27 0.25 0.01 0.01 0.02 0.02 0.22 0.22 0.22
Delay/Veh: 19.5 7.8 7.4 18.7 6.6 5.8 15.5 15.6 15.6 16.4 16.4 16.4
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 19.5 7.8 7.4 18.7 6.6 5.8 15.5 15.6 15.6 16.4 16.4 16.4
DesignQueue: 0 6 3 3 5 0 0 0 0 2 0 0

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Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #5 EAST SECOND / LAKE HERMAN

Average Delay (sec/veh): 2.7 Worst Case Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 1! 0 0	0 0 1! 0 0	0 0 1! 0 0	0 0 1! 0 0

Volume Module:

Base Vol:	3	8	212	1	15	2	2	37	29	392	123	17
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	8	212	1	15	2	2	37	29	392	123	17
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	8	212	1	15	2	2	37	29	392	123	17
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	3	8	223	1	16	2	2	39	31	413	129	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	3	8	223	1	16	2	2	39	31	413	129	18

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
% Cycle/Cars:	xxxx	xxxx	xxxx	xxxx
% Truck/Comb:	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx
Trck/Cmb PCE:	xxxx	xxxx	xxxx	xxxx
Adj Vol.:	3	9	245	1

Critical Gap Module:

MoveUp Time:	3.4	3.3	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	6.5	6.0	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	616	616	54	723	623	138	147	xxxx	xxxxx	69	xxxx	xxxxx
Potent Cap.:	466	518	1300	404	514	1178	1458	xxxx	xxxxx	1588	xxxx	xxxxx
Adj Cap:	0.73	0.69	1.00	0.60	0.69	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	339	355	1300	243	353	1178	1458	xxxx	xxxxx	1588	xxxx	xxxxx

Level Of Service Module:

Stopped Del:	10.7	10.4	3.3	14.9	10.7	3.1	2.5	xxxx	xxxxx	3.1	xxxx	xxxxx
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	1147	xxxxx	xxxx	372	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	3.7	xxxxx	xxxxx	10.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	A	A	C	A	A	A	A	A	A	A	A
ApproachDel:	3.7			10.1			0.1			2.3		

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Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 I-680 SB RAMP / LAKE HERMAN

Average Delay (sec/veh): 2.8 Worst Case Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	1 0 0 0 1	0 0 0 1 0	0 1 0 0 0

Volume Module: >> Count Date: 20 May 1999 <<

Base Vol:	0	0	0	43	0	397	0	195	57	61	140	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	43	0	397	0	195	57	61	140	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	43	0	397	0	195	57	61	140	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	45	0	418	0	205	60	64	147	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	45	0	418	0	205	60	64	147	0

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
% Cycle/Cars:	xxxx	xxxx	xxxx	xxxx
% Truck/Comb:	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx
Trck/Cmb PCE:	xxxx	xxxx	xxxx	xxxx
Adj Vol.:	0	0	0	50

Critical Gap Module:

MoveUp Time:	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	xxxx	xxxx	xxxxx	447	xxxx	147	xxxx	xxxx	xxxxx	265	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	584	xxxx	1166	xxxx	xxxx	xxxxx	1281	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	0.94	xxxx	1.00	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	548	xxxx	1166	xxxx	xxxx	xxxxx	1241	xxxx	xxxxx

Level Of Service Module:

Stopped Del:	xxxxx	xxxx	xxxxx	7.2	xxxx	4.8	xxxxx	xxxx	xxxxx	3.0	xxxx	xxxxx
LOS by Move:	A	A	A	B	A	A	A	A	A	A	A	A
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	0.0			5.0			0.0			1.0		

Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report												
1994 HCM Unsignalized Method (Future Volume Alternative)												
Intersection #7 I-680 NB RAMP/S / LAKE HERMAN												
Average Delay (sec/veh):		2.7		Worst Case Level Of Service: B								
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1	0	0	1	0	1	0	0	1	0
Volume Module: >> Count Date: 20 May 1999 <<												
Base Vol:	129	65	67	4	3	14	29	95	93	33	78	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	129	65	67	4	3	14	29	95	93	33	78	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	129	65	67	4	3	14	29	95	93	33	78	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	136	68	71	4	3	15	31	100	98	35	82	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol:	136	68	71	4	3	15	31	100	98	35	82	2
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol:	149	75	78	5	3	16	34	100	98	38	82	2
Critical Gap Module:												
Movement Time:	3.4	3.3	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gap:	6.5	6.0	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx
Capacity Module:												
Conflict Vol:	257	249	100	318	346	83	84	xxxx	xxxxx	198	xxxx	xxxxx
Potent Cap:	751	807	1232	693	718	1257	1563	xxxx	xxxxx	1380	xxxx	xxxxx
Adj Cap:	0.94	0.95	1.00	0.83	0.95	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap:	709	764	1232	577	680	1257	1563	xxxx	xxxxx	1380	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	6.3	5.2	3.1	6.3	5.3	2.9	2.3	xxxx	xxxxx	2.7	xxxx	xxxxx
LOS by Move:	A			A			A			A		
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap:	xxxx	812	xxxxx	617	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:xxxxx	5.2	xxxxx		5.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	B			B			A			A		
ApproachDel:	5.2			3.9			0.3			0.8		

Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report												
1994 HCM 4-Way Stop Method (Future Volume Alternative)												
Intersection #8 PARK / INDUSTRIAL												
Cycle (sec):	1					Critical Vol./Cap. (X):				0.6/7		
Loss Time (sec):	12 (Y+R = 4 sec)					Average Delay (sec/veh):				4.7		
Optimal Cycle:	0					Level Of Service:				A		
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	1	0	0	1	0	0	0	1	0	0	1	0
Volume Module:												
Base Vol:	106	87	149	15	51	5	4	25	121	136	59	38
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	87	149	15	51	5	4	25	121	136	59	38
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	106	87	149	15	51	5	4	25	121	136	59	38
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	112	92	157	16	54	5	4	26	127	143	62	40
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	112	92	157	16	54	5	4	26	127	143	62	40
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	112	92	157	16	54	5	4	26	127	143	62	40
Saturation Flow Module:												
Sat/Lane:	379	379	379	399	399	399	287	287	287	602	602	602
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.37	0.63	0.21	0.72	0.07	0.13	0.87	1.00	0.54	0.25	0.16
Final Sat.:	379	140	239	85	287	27	88	249	287	651	152	98
Capacity Analysis Module:												
Vol/Sat:	0.30	0.66	0.66	0.19	0.19	0.19	0.10	0.10	0.44	0.41	0.41	0.41
Crit Moves:	****			****			****			****		
ApproachV/S:	0.48			0.19			0.27			0.41		
Delay/Veh:	3.1	12.1	12.1	2.0	2.0	2.0	1.5	1.5	5.4	4.7	4.7	4.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	3.1	12.1	12.1	2.0	2.0	2.0	1.5	1.5	5.4	4.7	4.7	4.7
LOS by Move:	A	C	C	A	A	A	A	A	A	A	A	A
ApproachDel:	6.1			2.0			2.8			4.7		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	6.1			2.0			2.8			4.7		
LOS by Appr:	B			A			A			A		

Benicia Business Park EIR
Existing Conditions
AM Peak HourLevel Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #9 I-680 SB OFF / INDUSTRIAL

Average Delay (sec/veh): 1.9 Worst Case Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	1 0 0 0 1	0 0 1 0 0	0 0 1 0 0

Volume Module: >> Count Date: 20 May 1999 <<

Base Vol:	0	0	0	57	0	175	0	186	0	0	57	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	57	0	175	0	186	0	0	57	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	57	0	175	0	186	0	0	57	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	60	0	184	0	196	0	0	60	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	60	0	184	0	196	0	0	60	0

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
* Cycle/Cars:	xxxx	xxxx	xxxx	xxxx
* Truck/Comb:	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx
Trck/Cmb PCE:	xxxx	xxxx	xxxx	xxxx
Adj Vol.:	0	0	0	66

Critical Gap Module:

MoveUp Time:xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx
Critical Gp:xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	xxxx	xxxx	xxxxx	256	xxxx	60	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	753	xxxx	1291	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap.:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	753	xxxx	1291	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx

Level Of Service Module:

Stopped Del:xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx
LOS by Move:	B	A	A	A	A	A	A	A	A	A	A	A
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shared LOS:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Benicia Business Park EIR
Existing Conditions
AM Peak HourLevel Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #10 I-680 NB ON / INDUSTRIAL

Average Delay (sec/veh): 0.1 Worst Case Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	0 0 0 0 0	0 1 0 0 0	0 0 0 1 0

Volume Module:

Base Vol:	0	0	0	0	0	0	16	224	0	0	70	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	16	223	0	0	70	16
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	16	223	0	0	70	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	17	235	0	0	74	17
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	17	235	0	0	74	17

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
* Cycle/Cars:	xxxx	xxxx	xxxx	xxxx
* Truck/Comb:	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx
Trck/Cmb PCE:	xxxx	xxxx	xxxx	xxxx
Adj Vol.:	0	0	0	19

Critical Gap Module:

MoveUp Time:xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx
Critical Gp:xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	xxxx	xxxx	xxxxx	91	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	1552	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap.:	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	1552	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx

Level Of Service Module:

Stopped Del:xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shared LOS:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Benicia Business Park EIR
Existing Conditions
AM Peak HourLevel Of Service Computation Report
1994 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #11 PARK / HAYSHORE

Cycle (sec): 1 Critical Vol./Cap. (X): 1.064
 Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 7.5
 Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Stop Sign	Stop Sign
Rights:	Include	Include	Include	Include
Lanes:	0 1 0 0 1	1 0 0 1 0	0 0 1 0 0	0 1 0 0 1

Volume Module:

Base Vol:	9	15	16	177	67	65	10	8	5	41	22	333
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	9	15	16	177	67	65	10	8	5	41	22	333
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	9	15	16	177	67	65	10	8	5	41	22	333
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	9	16	17	186	71	68	11	8	5	43	23	351
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	9	16	17	186	71	68	11	8	5	43	23	351
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	9	16	17	186	71	68	11	8	5	43	23	351

Saturation Flow Module:

Sat/Lane:	305	305	305	428	428	428	438	438	438	330	330	330
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.36	0.64	1.00	1.00	0.51	0.49	0.46	0.33	0.21	0.65	0.35	1.00
Final Sat.:	110	195	305	428	219	209	201	146	91	215	115	330

Capacity Analysis Module:

Vol/Sat:	0.08	0.08	0.06	0.43	0.32	0.32	0.05	0.05	0.05	0.20	0.20	1.06
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
ApproachV/S:	0.07	0.38	0.05	0.63	0.05	0.63	0.05	0.63	0.05	0.63	0.05	0.63
Delay/Veh:	1.4	1.4	1.2	5.2	3.4	3.4	1.2	1.2	1.2	2.1	2.1	56.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.4	1.4	1.2	5.2	3.4	3.4	1.2	1.2	1.2	2.1	2.1	56.9
LOS by Move:	A	A	A	B	A	A	A	A	A	A	A	F
ApproachDel:	1.3	4.2	1.2	11.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ApprAdjDel:	1.3	4.2	1.2	11.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LOS by Appr:	A	A	A	C	A	A	A	A	A	A	A	C

Benicia Business Park EIR
Existing Conditions
AM Peak HourLevel Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #12 I-680 SB ON / HAYSHORE

Average Delay (sec/veh): 0.1 Worst Case Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	0 0 0 0 0	0 0 0 1 0	1 0 1 0 0

Volume Module:

Base Vol:	0	0	0	0	0	0	54	150	31	409	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	54	150	31	409	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	54	150	31	409	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	57	158	33	409	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	57	158	33	409	0

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
% Cycle/Cars:	xxxx	xxxx	xxxx	xxxx
% Truck/Comb:	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx
Trck/Cmb PCE:	xxxx	xxxx	xxxx	xxxx
Adj Vol.:	0	0	0	0

Critical Gap Module:

MoveUp Time:	xxxxx	xxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	5.0	xxxx	xxxxx

Capacity Module:

Cnflct Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	215	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1354	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1354	xxxx	xxxxx

Level Of Service Module:

Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.7	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - PT	LT - LTR - RT	LT - LTR - PT	LT - LTR - RT	LT - LTR - PT	LT - LTR - RT	LT - LTR - PT	LT - LTR - RT	LT - LTR - PT	LT - LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2

Benicia Business Park EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Average Delay (sec/veh): 5.0 Worst Case Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1	0	0	0	0	0	1	0	0	0

Volume Module:

Base Vol:	359	0	100	0	0	0	0	78	0	0	46	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Hse:	359	0	100	0	0	0	0	78	0	0	46	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	359	0	100	0	0	0	0	78	0	0	46	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	378	0	105	0	0	0	0	82	0	0	48	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	378	0	105	0	0	0	0	82	0	0	48	0

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
1 Cycle/Cars:	xxxx	xxxx	xxxx	xxxx
1 Truck/Comb:	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx
Trck/Comb PCE:	xxxx	xxxx	xxxx	xxxx
Adj Vol.:	416	0	116	0

Critical Gap Module:

MoveUp Time:	3.4	xxxx	2.6	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Critical Gp:	6.5	xxxx	5.5	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx

Capacity Module:

Conflict Vol:	131	xxxx	82	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Potent Cap.:	890	xxxx	1258	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Adj Cap:	1.00	xxxx	1.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Move Cap.:	890	xxxx	1258	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx

Level Of Service Module:

Stopped Del:	7.0	xxxx	3.1	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	950	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Shrd StpDel:xxxx	6.2	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Shared LOS:	B	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	6.2		0.0		0.0		0.0		0.0		0.0	

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I-780 ER RAMP

Cycle (sec): 100 Critical Vol./Cap. (X): 0.628
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 14.2
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 20 20	5 30 0	0 0 0	15 0 15
Lanes:	0 0 1 0 1	1 0 1 0 0	0 0 0 0 0	0 0 1 0 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	0 531 141	125 540	0 0 0	0 147 0	152
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00
Initial Bse:	0 531 141	125 540	0 0 0	0 147 0	152
Added Vol:	0 0 0	0 0 0	0 0 0	0 0 0	0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0	0
Initial Fut:	0 531 141	125 540	0 0 0	0 147 0	152
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00
PHF Adj:	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95	0.95
PHF Volume:	0 559 148	132 568	0 0 0	0 155 0	160
Reduced Vol:	0 0 0	0 0 0	0 0 0	0 0 0	0
Reduced Vol:	0 559 148	132 568	0 0 0	0 155 0	160
PCE Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00
MLF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00
Final Vol.:	0 559 148	132 568	0 0 0	0 155 0	160

Saturation Flow Module:

Sat/Lane:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Adjustment:	1.00 1.00 0.85	0.95 1.00 1.00	1.00 1.00 1.00	0.81 1.00 0.81
Lanes:	0.00 1.00 1.00	1.00 1.00 0.00	0.00 0.00 0.00	0.49 0.00 0.51
Final Sat.:	0 1900 1615	1805 1900	0 0 0	0 760 0 785

Capacity Analysis Module:

Vol/Sat:	0.00 0.29 0.09	0.07 0.30 0.00	0.00 0.00 0.00	0.20 0.00 0.20
Crit Moves:	****	****	****	****
Green Time:	0.0 46.9 46.9	11.7 58.5 0.0	0.0 0.0 0.0	32.5 0.0 32.5
Volume/Cap:	0.00 0.63 0.20	0.63 0.51 0.00	0.00 0.00 0.00	0.63 0.00 0.63
Delay/Veh:	0.0 13.9 10.1	31.2 8.3 0.0	0.0 0.0 0.0	20.3 0.0 20.3
User DelAdj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
AdjDel/Veh:	0.0 13.9 10.1	31.2 8.3 0.0	0.0 0.0 0.0	20.3 0.0 20.3
DesignQueue:	0 18 4	7 14 0	0 0 0	6 0 6

Benicia Business Park EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 EAST SECOND / I-780 WB RAMP

Average Delay (sec/veh): 61.5 Worst Case Level Of Service: F

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Uncontrolled	Uncontrolled	Stop Sign	Stop Sign
Rights:	Include	Include	Include	Include
Lanes:	1 0 1 0 0	1 0 1 0 1	0 0 0 0 0	1 0 0 0 1

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM

Base Vol:	240 395 0	0 489 174	0 0 0	166 0 141
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	240 395 0	0 489 174	0 0 0	166 0 131
Added Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	240 395 0	0 489 174	0 0 0	166 0 131
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95
PHF Volume:	253 416 0	0 515 183	0 0 0	175 0 148
Reduced Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Final Vol.:	253 416 0	0 515 183	0 0 0	175 0 138

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
# Cycle/Cars:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
# Truck/Comb:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
PCE Adj:	1.10 1.00 1.00	1.10 1.00 1.00	1.10 1.10 1.10	1.10 1.10 1.10
Cycl/Car PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Trck/Cmb PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Adj Vol.:	278 416 0	0 515 183	0 0 0	192 0 152

Critical Gap Module:

MoveUp Time:	2.1 xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	3.4 xxxx 2.6
Critical Gp:	5.0 xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	6.5 xxxx 5.5

Capacity Module:

Conflict Vol:	698 xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	1183 xxxx 416
Potent Cap.:	797 xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	219 xxxx 852
Adj Cap.:	1.00 xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	0.65 xxxx 1.00
Move Cap.:	797 xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	142 xxxx 852

Level Of Service Module:

Stopped Del:	6.6 xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	542.0 xxxx 5.0
LOS by Move:	B * * *	* * *	* * *	F * B
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx
Shrd Stphel:	xxxx xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx	xxxx xxxx xxxxx
Shared LOS:	* * *	* * *	* * *	* * *
ApproachDel:	7.6	0.0	0.0	105.1

Benicia Business Park EIR
Existing Conditions
PM Peak HourLevel Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #3 EAST SECOND / ROSE

Cycle (sec): 60 Critical Vol./Cap. (X): 0.428
 Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 14.6
 Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	1	0	2	0	0	1	1	0	1	0	0	0

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM
 Base Vol: 269 212 0 0 312 141 56 0 134 0 0 0
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 269 212 0 0 312 141 56 0 134 0 0 0
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 269 212 0 0 312 141 56 0 134 0 0 0
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHE Volume: 269 212 0 0 312 141 56 0 134 0 0 0
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 269 212 0 0 312 141 56 0 134 0 0 0
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.05 1.00 1.00 1.05 1.05 1.00 1.00 1.00 1.00 1.00 1.00
 Final Vol: 269 223 0 0 328 148 56 0 134 0 0 0

Saturation Flow Module:
 Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 0.95 1.00 1.00 1.00 0.95 0.95 0.95 1.00 0.85 1.00 1.00 1.00
 Lanes: 1.00 2.00 0.00 0.00 1.38 0.62 1.00 0.00 1.00 0.00 0.00 0.00
 Final Sat: 1805 3800 0 0 2488 1122 1805 0 1615 0 0 0

Capacity Analysis Module:
 Vol/Sat: 0.15 0.06 0.00 0.00 0.13 0.13 0.03 0.00 0.08 0.00 0.00 0.00
 Crit Moves: ****
 Green Time: 10.0 30.0 0.0 0.0 20.0 20.0 21.0 0.0 21.0 0.0 0.0 0.0
 Volume/Cap: 0.89 0.12 0.00 0.00 0.40 0.40 0.09 0.00 0.24 0.00 0.00 0.00
 Delay/Veh: 34.7 5.1 0.0 0.0 10.0 10.0 8.5 0.0 9.0 0.0 0.0 0.0
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 34.7 5.1 0.0 0.0 10.0 10.0 8.5 0.0 9.0 0.0 0.0 0.0
 DesignQueue: 8 4 0 0 8 3 1 0 3 0 0 0

Benicia Business Park EIR
Existing Conditions
PM Peak HourLevel Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #4 EAST SECOND / INDUSTRIAL

Cycle (sec): 80 Critical Vol./Cap. (X): 0.385
 Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 11.0
 Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	5	20	20	5	20	20	18	18	18	18	18	18
Lanes:	1	0	1	0	1	1	1	0	1	0	0	1

Volume Module: 4:00 - 6:00 PM
 Base Vol: 3 161 90 34 327 2 6 14 19 111 17 88
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 3 161 90 34 327 2 6 14 19 111 17 88
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 3 161 90 34 327 2 6 14 19 111 17 88
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHE Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
 PHE Volume: 3 169 95 36 344 2 6 15 20 117 18 93
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 3 169 95 36 344 2 6 15 20 117 18 93
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Final Vol: 3 169 95 36 344 2 6 15 20 117 18 93

Saturation Flow Module:
 Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.83 0.91 0.91 0.76 0.76 0.76
 Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 0.43 0.57 0.51 0.68 0.41
 Final Sat: 1805 1900 1615 1805 1900 1615 1577 741 988 737 113 586

Capacity Analysis Module:
 Vol/Sat: 0.00 0.09 0.06 0.02 0.18 0.00 0.00 0.02 0.02 0.16 0.16 0.16
 Crit Moves: ****
 Green Time: 5.0 32.1 32.1 8.0 35.2 35.2 30.8 30.8 30.8 30.8 30.8 30.8
 Volume/Cap: 0.03 0.22 0.15 0.20 0.41 0.00 0.01 0.05 0.05 0.41 0.41 0.41
 Delay/Veh: 22.7 10.2 9.8 21.4 10.1 8.1 9.8 10.0 10.0 11.9 11.9 11.9
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 22.7 10.2 9.8 21.4 10.1 8.1 9.8 10.0 10.0 11.9 11.9 11.9
 DesignQueue: 0 5 3 1 9 0 0 0 1 3 1 4

Benicia Business Park EIR
Existing Conditions
PM Peak HourLevel Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #5 EAST SECOND / LAKE HERMAN

Average Delay (sec/veh): 4.1 Worst Case Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R

Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 1 0 0	0 0 1 0 0	0 0 1 0 0	0 0 1 0 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	22	87	469	20	20	9	5	16	16	275	42	55
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	22	87	469	20	20	9	5	16	16	275	42	55
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	22	87	469	20	20	9	5	16	16	275	42	55
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	23	92	494	21	21	9	5	17	17	289	44	58
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol:	23	92	494	21	21	9	5	17	17	289	44	58
Adjusted Volume Module:												
Grade:	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
% Cycle/Cars:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
% Truck/Comb:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Trck/Cmb PCE:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Adj Vol:	25	101	543	23	23	10	6	17	17	318	44	58

Critical Gap Module:												
MoveUp Time:	3.4	3.3	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxxx	2.1	xxxx	xxxxxx
Critical Gp:	6.5	6.0	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxxx	5.0	xxxx	xxxxxx

Capacity Module:												
Conflict Vol:	408	422	25	686	402	73	102	xxxx	xxxxxx	34	xxxx	xxxxxx
Potent Cap:	614	655	1344	424	672	1271	1533	xxxx	xxxxxx	1652	xxxx	xxxxxx
Adj Cap:	0.81	0.79	1.00	0.43	0.79	1.00	1.00	xxxx	xxxxxx	1.00	xxxx	xxxxxx
Move Cap:	495	519	1344	182	532	1271	1533	xxxx	xxxxxx	1652	xxxx	xxxxxx

Level Of Service Module:												
Stopped Del:	7.6	8.4	4.2	22.4	7.0	2.9	2.4	xxxx	xxxxxx	2.6	xxxx	xxxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap:	xxxx	1030	xxxxxx	xxxx	317	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Shrd StpDel:xxxxx	5.0	xxxxxx	xxxxxx	12.5	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxx	xxxxxx
Shared LOS:	A	A	C	A	A	C	A	A	C	A	A	C
ApproachDel:	5.0			12.5			0.3			2.0		

Benicia Business Park EIR
Existing Conditions
PM Peak HourLevel Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 I-800 SB RAMP / LAKE HERMAN

Average Delay (sec/veh): 1.4 Worst Case Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R

Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	1 0 0 0 1	0 0 0 1 0	0 1 0 0 0

Volume Module: Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	0	0	14	0	160	0	375	129	120	209	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	14	0	160	0	375	129	120	209
Added Vol:	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	14	0	160	0	375	129	120	209
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	15	0	168	0	395	136	126	220
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0
Final Vol:	0	0	0	15	0	168	0	395	136	126	220
Adjusted Volume Module:											
Grade:	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
% Cycle/Cars:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
% Truck/Comb:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Trck/Cmb PCE:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Adj Vol:	0	0	0	16	0	185	0	395	136	139	220

Critical Gap Module:												
MoveUp Time:xxxxxx	xxxxxx	xxxxxx	xxxxxx	3.4	xxxxxx	2.6	xxxxxx	xxxxxx	xxxxxx	2.1	xxxxxx	xxxxxx
Critical Gp:xxxxxx	xxxxxx	xxxxxx	xxxxxx	6.5	xxxxxx	5.5	xxxxxx	xxxxxx	xxxxxx	5.0	xxxxxx	xxxxxx

Capacity Module:												
Conflict Vol:	xxxx	xxxx	xxxxxx	809	xxxxxx	220	xxxx	xxxx	xxxxxx	531	xxxx	xxxxxx
Potent Cap:	xxxx	xxxx	xxxxxx	360	xxxxxx	1071	xxxx	xxxx	xxxxxx	958	xxxx	xxxxxx
Adj Cap:	xxxx	xxxx	xxxxxx	0.83	xxxxxx	1.00	xxxx	xxxx	xxxxxx	1.00	xxxx	xxxxxx
Move Cap:	xxxx	xxxx	xxxxxx	300	xxxxxx	1071	xxxx	xxxx	xxxxxx	958	xxxx	xxxxxx

Level Of Service Module:												
Stopped Del:xxxxxx	xxxxxx	xxxxxx	xxxxxx	12.6	xxxxxx	4.0	xxxxxx	xxxxxx	xxxxxx	4.3	xxxxxx	xxxxxx
LOS by Move:	*	*	*	C	*	A	*	*	*	A	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap:	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx	xxxx	xxxx	xxxxxx
Shrd StpDel:xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	0.0			4.7			0.0			1.1		

Existing PM	Mon Sep 27, 1999 09:45:53										Page 9-1
Benicia Business Park EIR											
Existing Conditions											
PM Peak Hour											
Level of Service Computation Report											
1994 HCM Unsignalized Method (Future Volume Alternative)											
Intersection #7 I-680 NB RAMP / LAKE HERMAN											
Average Delay (sec/veh): 2.4 Worst Case Level Of Service: B											
Approach: North Bound South Bound East Bound West Bound											
Movement: L - T - R L - T - R L - T - R L - T - R											
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled											
Rights: Include Include Include Include											
Lanes: 0 0 1 0 0 0 1 0 0 1 0 1 0 0 1 0 1 0 0 0											
Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM											
Base Vol: 140 3 22 1 3 60 27 40 320 100 133 0											
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00											
Initial Bse: 140 3 22 1 3 60 27 40 320 100 133 0											
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0											
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0											
Initial Fut: 140 3 22 1 3 60 27 40 320 100 133 0											
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00											
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95											
PHF Volume: 147 3 23 1 3 63 28 42 337 105 140 0											
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0											
Final Vol: 147 3 23 1 3 63 28 42 337 105 140 0											
Adjusted Volume Module:											
Grade: 0% 0% 0% 0%											
# Cycle/Cars: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx											
# Truck/Comb: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx											
PCE Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10											
Cycl/Car PCE: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx											
Trck/Comb PCE: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx											
Adj Vol: 162 3 25 1 3 69 31 42 337 116 140 0											
Critical Gap Module:											
MoveUp Time: 3.4 3.3 2.6 3.4 3.3 2.6 2.1 xxxx xxxxxx 2.1 xxxx xxxxxx											
Critical Gap: 6.5 6.0 5.5 6.5 6.0 5.5 5.0 xxxxx xxxxxx 5.0 xxxxx xxxxxx											
Capacity Module:											
Cnflct Vol: 349 316 42 329 653 140 140 xxxx xxxxxx 379 xxxx xxxxxx											
Potent Cap.: 665 745 1318 683 496 1176 1470 xxxx xxxxxx 1131 xxxx xxxxxx											
Adj Cap: 0.84 0.86 1.00 0.87 0.86 1.00 1.00 xxxx xxxxxx 1.00 xxxx xxxxxx											
Move Cap.: 557 644 1318 597 428 1176 1470 xxxx xxxxxx 1131 xxxx xxxxxx											
Level Of Service Module:											
Stopped Del: 8.8 5.6 2.8 6.0 8.5 3.2 2.5 xxxx xxxxxx 3.5 xxxx xxxxxx											
LOS by Move: * * A A * * A * *											
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT											
Shared Cap.: xxxx 605 xxxxxx 461 xxxx xxxxxx xxxx xxxx xxxxxx											
Shrd StpDel:xxxxxx 7.9 xxxxxx 7.9 xxxx xxxxxx xxxxxx xxxx xxxxxx											
Shared LOS: * B * B * * * * *											
ApproachDel: 7.9 3.5 0.2 1.6											

Existing PM	Mon Sep 27, 1999 09:45:53										Page 10-1															
Benicia Business Park EIR																										
Existing Conditions																										
PM Peak Hour																										
Level Of Service Computation Report																										
1994 HCM 4-Way Stop Method (Future Volume Alternative)																										

Intersection #8 PARK / INDUSTRIAL																										

Cycle (sec):	1		Critical Vol./Cap. (X):							0.540																
Loss Time (sec):	12 (Y+R = 4 sec)		Average Delay (sec/veh):							5.8																
Optimal Cycle:	0		Level Of Service:							B																

Approach:	North Bound			South Bound			East Bound			West Bound																
Movement:	L	T	R	L	T	R	L	T	R	L	T	R														
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																										
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign																
Rights:	Include			Include			Include			Include																
Lanes:	1	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																										
Volume Module: 4:00 - 6:00 PM																										
Base Vol:	111	64	96	22	110	22	36	98	135	128	29	12														
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00														
Initial Bse:	111	64	96	22	110	22	36	98	135	128	29	12														
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0														
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0														
Initial Fut:	111	64	96	22	110	22	36	98	135	128	29	12														
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00														
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95														
PHF Volume:	117	67	101	23	116	23	38	103	142	135	31	13														
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0														
Reduced Vol:	117	67	101	23	116	23	38	103	142	135	31	13														
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00														
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00														
Final Vol.:	117	67	101	23	116	23	38	103	142	135	31	13														
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																										
Saturation Flow Module:																										
Sat/Lane:	357	357	357	335	335	335	263	263	263	464	464	464														
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00														
Lanes:	1.00	0.40	0.60	0.14	0.72	0.14	0.27	0.73	1.00	0.76	0.17	0.07														
Final Sat.:	357	142	215	48	240	48	71	192	263	350	80	34														
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																										
Capacity Analysis Module:																										
Vol/Sat:	0.33	0.47	0.47	0.48	0.48	0.48	0.54	0.54	0.54	0.39	0.39	0.39														
Crit Moves:	****			****			****			****																
ApproachV/S:	0.40			0.48			0.54			0.39																
Delay/Veh:	3.5	6.0	6.0	6.3	6.3	6.3	7.7	7.7	7.8	4.3	4.3	4.3														
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00														
AdjDel/Veh:	3.5	6.0	6.0	6.3	6.3	6.3	7.7	7.7	7.8	4.3	4.3	4.3														
LOS by Move:	A	B	B	B	B	B	B	B	B	A	A	A														
ApproachDel:	4.6			6.3			7.7			4.3																
Delay Adj:	1.00			1.00			1.00			1.00																
ApprAdjDel:	4.6			6.3			7.7			4.3																
LOS by Appr:	A			B			B			A																

Benicia Business Park EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #9 I-680 SB OFF / INDUSTRIAL

Average Delay (sec/veh): 0.5 Worst Case Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	1 0 0 0 1	0 0 1 0 0	0 0 1 0 0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	0 0 0	11 0 38	0 217 0	0 134 0
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	0 0 0	11 0 38	0 217 0	0 134 0
Added Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	0 0 0	11 0 38	0 217 0	0 134 0
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95
PHF Volume:	0 0 0	12 0 40	0 228 0	0 141 0
Reduct Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Final Vol.:	0 0 0	12 0 40	0 228 0	0 141 0

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
% Cycle/Cats:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
% Truck/Comb:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
PCE Adj:	1.10 1.10 1.10	1.10 1.10 1.10	1.10 1.00 1.00	1.10 1.00 1.00
Cycl/Car PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Trck/Cmb PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Adj Vol.:	0 0 0	13 0 44	0 228 0	0 141 0

Critical Gap Module:

MoveUp Time:xxxxx	xxxx xxxx	3.4 xxxx	2.6 xxxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Critical Gp:xxxxx	xxxx xxxx	6.5 xxxx	5.5 xxxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx

Capacity Module:

Cnflct Vol:	xxxx xxxx	369 xxxx	141 xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Potent Cap.:	xxxx xxxx	647 xxxx	1175 xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Adj Cap:	xxxx xxxx	1.00 xxxx	1.00 xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Move Cap.:	xxxx xxxx	647 xxxx	1175 xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx

Level Of Service Module:

Stopped Del:xxxxx	xxxx xxxx	5.7 xxxx	3.2 xxxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
LOS by Move:	B	A	A	A	A	A
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Shrd StpDel:xxxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Shared LOS:	A	A	A	A	A	A
ApproachDel:	0.0	3.7	0.0	0.0	0.0	0.0

Benicia Business Park EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #10 I-680 NB ON / INDUSTRIAL

Average Delay (sec/veh): 1.3 Worst Case Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	0 0 0 0 0	0 1 0 0 0	0 0 0 1 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	0 0 0	0 0 0	171 55 0	0 132 66
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	0 0 0	0 0 0	171 55 0	0 132 66
Added Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	0 0 0	0 0 0	171 55 0	0 132 66
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95	0.95 0.95 0.95
PHF Volume:	0 0 0	0 0 0	180 58 0	0 139 69
Reduct Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Final Vol.:	0 0 0	0 0 0	180 58 0	0 139 69

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
% Cycle/Cats:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
% Truck/Comb:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
PCE Adj:	1.10 1.10 1.10	1.10 1.10 1.10	1.10 1.00 1.00	1.10 1.00 1.00
Cycl/Car PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Trck/Cmb PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Adj Vol.:	0 0 0	0 0 0	198 58 0	0 139 69

Critical Gap Module:

MoveUp Time:xxxxx	xxxx xxxx	xxxx xxxx	2.1 xxxx	xxxx xxxx	xxxx xxxx
Critical Gp:xxxxx	xxxx xxxx	xxxx xxxx	5.0 xxxxx	xxxx xxxx	xxxx xxxx

Capacity Module:

Cnflct Vol:	xxxx xxxx	xxxx xxxx	208 xxxx	xxxx xxxx	xxxx xxxx
Potent Cap.:	xxxx xxxx	xxxx xxxx	1364 xxxx	xxxx xxxx	xxxx xxxx
Adj Cap:	xxxx xxxx	xxxx xxxx	1.00 xxxx	xxxx xxxx	xxxx xxxx
Move Cap.:	xxxx xxxx	xxxx xxxx	1364 xxxx	xxxx xxxx	xxxx xxxx

Level Of Service Module:

Stopped Del:xxxxx	xxxx xxxx	xxxx xxxx	3.0 xxxx	xxxx xxxx	xxxx xxxx
LOS by Move:	A	A	A	A	A
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Shrd StpDel:xxxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Shared LOS:	A	A	A	A	A
ApproachDel:	0.0	0.0	2.4	0.0	0.0

Existing FM	Mon Sep 27, 1999 09:45:53										Page 13-1	
Benicia Business Park EIR												
Existing Conditions												
PM Peak Hour												

Level Of Service Computation Report												
1994 HCM 4-Way Stop Method (Future Volume Alternative)												
.....												
Intersection #11 PARK / BAYSHORE												
.....												
Cycle (sec):	1		Critical Vol./Cap. (X):		1.099							
Loss Time (sec):	9 (Y+R = 4 sec)		Average Delay (sec/veh):		7.0							
Optimal Cycle:	0		Level Of Service:		B							
.....												
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	1	0	0	1	0	0	0	1	0	0	1

Volume Module: 4:00 - 6:00 PM												
Base Vol:	3	87	39	283	27	4	27	16	5	38	15	190
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	87	39	283	27	4	27	16	5	38	15	190
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	87	39	283	27	4	27	16	5	38	15	190
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	3	92	41	298	28	4	28	17	5	40	16	200
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	92	41	298	28	4	28	17	5	40	16	200
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	3	92	41	298	28	4	28	17	5	40	16	200

Saturation Flow Module:												
Sat/Lane:	271	271	271	469	469	469	242	242	242	182	182	182
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.03	0.97	1.00	1.00	0.88	0.12	0.56	0.34	0.10	0.71	0.29	1.00
Final Sat:	9	262	271	469	410	59	136	82	24	130	52	182

Capacity Analysis Module:												
Vol/Sat:	0.35	0.35	0.15	0.64	0.07	0.07	0.21	0.21	0.21	0.31	0.31	1.10
Crit Moves:	***			***			***			***		
ApproachV/S:	0.25			0.35			0.21			0.70		
Delay/Veh:	3.8	3.8	1.8	11.2	1.3	1.3	2.2	2.2	2.2	3.2	3.2	65.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	3.8	3.8	1.8	11.2	1.3	1.3	2.2	2.2	2.2	3.2	3.2	65.1
LOS by Move:	A	A	A	C	A	A	A	A	A	A	A	F
ApproachDel:	2.6			3.8			2.2			14.5		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	2.6			3.8			2.2			14.5		
LOS by Appr:	A			A			A			C		
.....												

Existing FM	Mon Sep 27, 1999 09:45:53										Page 14-1		
Benicia Business Park EIR													
Existing Conditions													
PM Peak Hour													

Level Of Service Computation Report													
1994 HCM Unsignalized Method (Future Volume Alternative)													
.....													
Intersection #12 I-680 SB ON / BAYSHORE													
.....													
Average Delay (sec/veh):		0.3		Worst Case Level Of Service:		A							
.....													
Approach:		North Bound			South Bound			East Bound			West Bound		
Movement:		L - T - R			L - T - R			L - T - R			L - T - R		

Control:		Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:		Include			Include			Include			Include		
Lanes:		0 0 0 0 0			0 0 0 0 0			0 0 0 1 0			1 0 1 0 0		

Volume Module: 4:00 - 6:00 PM													
Base Vol:		0 0 0			0 0 0			0 39 301			60 245 0		
Growth Adj:		1.00 1.00 1.00			1.00 1.00 1.00			1.00 1.00 1.00			1.00 1.00 1.00		
Initial Bse:		0 0 0			0 0 0			0 39 301			60 245 0		
Added Vol:		0 0 0			0 0 0			0 0 0			0 0 0		
PasserByVol:		0 0 0			0 0 0			0 0 0			0 0 0		
Initial Fut:		0 0 0			0 0 0			0 39 301			60 245 0		
User Adj:		1.00 1.00 1.00			1.00 1.00 1.00			1.00 1.00 1.00			1.00 1.00 1.00		
PHF Adj:		0.95 0.95 0.95			0.95 0.95 0.95			0.95 0.95 0.95			0.95 0.95 0.95		
PHF Volume:		0 0 0			0 0 0			0 41 317			63 258 0		
Reduct Vol:		0 0 0			0 0 0			0 0 0			0 0 0		
Final Vol:		0 0 0			0 0 0			0 41 317			63 258 0		
Adjusted Volume Module:													
Grade:		0%			0%			0%			0%		
% Cycle/Cars:		xxxx xxxx			xxxx xxxx			xxxx xxxx			xxxx xxxx		
% Truck/Comb:		xxxx xxxx			xxxx xxxx			xxxx xxxx			xxxx xxxx		
PCE Adj:		1.10 1.10 1.10			1.10 1.10 1.10			1.10 1.00 1.00			1.10 1.00 1.00		
Cycl/Car PCE:		xxxx xxxx			xxxx xxxx			xxxx xxxx			xxxx xxxx		
Trck/Comb PCE:		xxxx xxxx			xxxx xxxx			xxxx xxxx			xxxx xxxx		
Adj Vol:		0 0 0			0 0 0			0 41 317			69 258 0		
Critical Gap Module:													
MoveUp Time:xxxxx xxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx										2.1 xxxxx xxxxxx			
Critical Gap:xxxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx xxxxxx xxxxxx xxxxxx										5.0 xxxxx xxxxxx			

Capacity Module:													
Conflict Vol:		xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			358 xxxxx xxxxxx		
Potent Cap:		xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			1158 xxxxx xxxxxx		
Adj Cap:		xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			1.00 xxxxx xxxxxx		
Move Cap:		xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			1158 xxxxx xxxxxx		

Level Of Service Module:													
Stopped Del:xxxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx										3.3 xxxxx xxxxxx			
LOS by Move:										A			
Movement:		LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap:		xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			xxxx xxxx xxxxxx			xxxx xxxx xxxxxx		
Shrd StpDel:xxxxxx xxxx xxxxxx		xxxxxx xxxx xxxxxx			xxxxxx xxxx xxxxxx			xxxxxx xxxx xxxxxx			xxxxxx xxxx xxxxxx		
Shared LOS:		A			A			A			A		
ApproachDel:		0.0			0.0			0.0			0.7		

Benicia Business Park EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Average delay (sec/veh): 2.9 Worst Case Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 1 0 0	0 0 0 0 0	0 0 1 0 0	0 0 1 0 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	174	0	17	0	0	0	0	39	0	0	130	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	174	0	17	0	0	0	0	39	0	0	130	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	174	0	17	0	0	0	0	39	0	0	130	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	183	0	18	0	0	0	0	41	0	0	137	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	183	0	18	0	0	0	0	41	0	0	137	0

Adjusted Volume Module:

Grade:	0%	0%	0%	0%
* Cycle/Cars:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
* Truck/Comb:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
PCE Adj:	1.10 1.10 1.10	1.10 1.10 1.10	1.10 1.00 1.00	1.10 1.00 1.00
Cycl/Car PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Trek/Comb PCE:	xxxx xxxx	xxxx xxxx	xxxx xxxx	xxxx xxxx
Adj Vol.:	201 0 20	0 0 0	0 41 0	0 137 0

Critical Gap Module:

MoveUp Time:	3.4 xxxx	2.6 xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx
Critical Gp:	6.5 xxxx	5.5 xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx

Capacity Module:

Conflict Vol:	178 xxxx	41	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx
Polent Cap.:	845 xxxx	1320	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx
Adj Cap:	1.00 xxxx	1.00	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx
Move Cap.:	845 xxxx	1320	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx

Level Of Service Module:

Stopped Del:	5.5 xxxx	2.8 xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx
LOS by Move:	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap.:	xxxx 863 xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx
Shrd Stplbel:xxxxx	5.3 xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx	xxxx xxxxx
Shared LOS:	B	*	*	*	*	*	*	*
ApproachDel:	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0

YEAR 2010 NO PROJECT CONDITIONS

TURNING MOVEMENTS VOLUME DEVELOPMENT LEVEL OF SERVICE ANALYSIS

The first set of tables in this section were used to develop the 2010 Base volumes from the Solano County Transportation Authority travel demand model as described in the EIR text. The model only forecasts PM peak hour volumes so the AM peak hour volumes for this analysis were derived from comparing existing AM to PM volumes. The second set of tables are the 2010 No Project volumes. The added line shows the Tourtelot residential development trips at each study intersections. The Total line includes the 2010 Base volumes plus the Tourtelot residential development trips. The level of service calculation sheets for each study intersection follows.

Peak Period =	P.M.
Year of Existing Counts =	1999
Base Year of Model Volumes =	1990
Future Year of Model Volumes =	2010

A.M.
1999
1990
2010

Intersection 1: E. Second / I-780 EB ramps1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	0	531	141
SB	125	540	0
EB	0	0	0
WB	147	0	152

1999 Count A.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	0	312	126
SB	264	302	0
EB	0	0	0
WB	185	0	271

Differences between
A.M. and P.M. Peak Periods

	LT	TH	RT
NB		59%	89%
SB	211%	56%	
EB			
WB	126%		178%

2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	531	141
SB	192	722	0
EB	0	0	0
WB	172	0	162

Final 2010 A.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	312	126
SB	406	404	0
EB	0	0	0
WB	217	0	288

Intersection 2: E. Second / I-780 WB rampsExisting P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	240	395	0
SB	0	489	174
EB	0	0	0
WB	166	0	131

1999 Count A.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	180	335	0
SB	0	432	158
EB	0	0	0
WB	103	0	153

Differences between
A.M. and P.M. Peak Periods

	LT	TH	RT
NB	75%	85%	
SB		88%	91%
EB			
WB	62%		117%

2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	332	395	0
SB	0	489	335
EB	0	0	0
WB	666	0	348

Final 2010 A.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	249	335	0
SB	0	432	304
EB	0	0	0
WB	413	0	406

Intersection 3: E. Second / RoseExisting P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	269	212	0
SB	0	312	141
EB	56	0	134
WB	0	0	0

1999 Count A.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	100	242	0
SB	0	230	39
EB	149	0	358
WB	0	0	0

Differences between
A.M. and P.M. Peak Periods

	LT	TH	RT
NB	37%	114%	
SB		74%	28%
EB	266%		267%
WB			

2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	454	291	0
SB	0	312	379
EB	113	0	134
WB	0	0	0

Final 2010 A.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	169	332	0
SB	0	230	105
EB	300	0	358
WB	0	0	0

Intersection 4: Industrial / E. SecondExisting P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	6	14	19
SB	111	17	88
EB	34	327	2
WB	3	161	90

1999 Count A.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	2	3	5
SB	53	9	12
EB	82	238	11
WB	5	242	125

Differences between
A.M. and P.M. Peak Periods

	LT	TH	RT
NB	33%	21%	26%
SB	48%	53%	14%
EB	241%	73%	550%
WB	167%	150%	139%

2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	600	14	28
SB	111	17	88
EB	34	362	94
WB	3	212	248

Final 2010 A.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	200	3	7
SB	53	9	12
EB	82	264	515
WB	5	319	344

Intersection 5: E. Second / Lake Herman

Existing P M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	22	87	469
SB	20	20	9
EB	5	16	16
WB	275	42	55

1999 Count A M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	3	8	212
SB	1	15	2
EB	2	37	29
WB	392	123	17

Differences between A M and P M Peak Periods			
	LT	TH	RT
NB	14%	9%	45%
SB	5%	75%	22%
EB	40%	231%	181%
WB	143%	293%	31%

2010 P M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	117	87	536
SB	20	20	12
EB	20	19	16
WB	275	493	140

Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	16	8	242
SB	1	15	3
EB	8	45	29
WB	392	1,444	43

Intersection 6: I-680 SB ramps / Lake Herman

Existing P M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	14	0	160
EB	0	375	129
WB	120	209	0

1999 Count A M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	43	0	397
EB	0	195	57
WB	61	140	0

Differences between A M and P M Peak Periods			
	LT	TH	RT
NB			
SB	307%		248%
EB		52%	44%
WB	51%	67%	

2010 P M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	33	0	223
EB	0	473	129
WB	120	643	0

Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	102	0	553
EB	0	246	57
WB	61	431	0

Intersection 7: Goodyear - I-680 NB ramp / Lake Herman

Existing P M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	140	3	22
SB	1	3	60
EB	27	40	320
WB	100	133	0

1999 Count A M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	129	65	67
SB	4	3	14
EB	29	95	93
WB	33	78	2

Differences between A M and P M Peak Periods			
	LT	TH	RT
NB	92%	2167%	305%
SB	400%	100%	23%
EB	107%	238%	29%
WB	33%	59%	

2010 P M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	505	15	78
SB	2	3	60
EB	27	70	434
WB	258	249	0

Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	465	332	237
SB	9	3	14
EB	29	165	126
WB	85	146	0

Intersection 8: Park / Industrial

Existing P M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	111	64	96
SB	22	110	22
EB	36	98	135
WB	128	29	12

1999 Count A M Peak Period Turning Movement Volumes			
	LT	TH	RT
NB	106	87	149
SB	15	51	5
EB	4	25	121
WB	136	59	38

Differences between A M and P M Peak Periods			
	LT	TH	RT
NB	95%	136%	155%
SB	68%	46%	23%
EB	11%	26%	90%
WB	106%	203%	317%

2010 P M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	478	181	464
SB	58	421	22
EB	36	98	135
WB	547	98	203

Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT
NB	456	246	522
SB	40	195	5
EB	4	25	121
WB	277	95	308

Intersection 9: I-680 SB Off / Industrial

Existing P M Peak Period Turning Movement Volumes				1999 Count A M Peak Period Turning Movement Volumes				Differences between A M and P M Peak Periods				2010 P M Peak Hour Turning Movement Volumes				Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT
NB	0	0	0	NB	0	0	0	NB				NB	0	0	0	NB	0	0	0
SB	11	0	38	SB	57	0	175	SB	518%		461%	SB	11	0	86	SB	57	0	395
EB	0	217	0	EB	0	186	0	EB		86%		EB	0	685	0	EB	0	587	0
WB	0	134	0	WB	0	57	0	WB		43%		WB	0	669	0	WB	0	285	0

Intersection 10: I-680 NB On / Industrial

Existing P M Peak Period Turning Movement Volumes				1999 Count A M Peak Period Turning Movement Volumes				Differences between A M and P M Peak Periods				2010 P M Peak Hour Turning Movement Volumes				Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT
NB	0	0	0	NB	0	0	0	NB				NB	0	0	0	NB	0	0	0
SB	0	0	0	SB	0	0	0	SB				SB	0	0	0	SB	0	0	0
EB	171	55	0	EB	16	223	0	EB	9%	405%		EB	209	473	0	EB	20	624	0
WB	0	132	66	WB	0	70	16	WB		53%	24%	WB	0	660	66	WB	0	350	16

Intersection 11: Park / Bayshore

Existing P M Peak Period Turning Movement Volumes				1999 Count A M Peak Period Turning Movement Volumes				Differences between A M and P M Peak Periods				2010 P M Peak Hour Turning Movement Volumes				Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT
NB	3	87	39	NB	9	15	16	NB	300%	17%	41%	NB	26	132	39	NB	78	23	16
SB	283	27	4	SB	177	67	65	SB	63%	248%	1625%	SB	1,012	57	45	SB	633	140	729
EB	27	16	5	EB	10	8	5	EB	37%	50%	100%	EB	50	98	44	EB	18	49	44
WB	38	15	190	WB	41	22	333	WB	108%	147%	175%	WB	226	20	854	WB	243	30	1,083

Intersection 12: I-680 SB On / Bayshore

Existing P M Peak Period Turning Movement Volumes				1999 Count A M Peak Period Turning Movement Volumes				Differences between A M and P M Peak Periods				2010 P M Peak Hour Turning Movement Volumes				Final 2010 A M Peak Hour Turning Movement Volumes			
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT
NB	0	0	0	NB	0	0	0	NB				NB	0	0	0	NB	0	0	0
SB	0	0	0	SB	0	0	0	SB				SB	0	0	0	SB	0	0	0
EB	0	39	301	EB	0	54	150	EB		138%	50%	EB	0	39	1,102	EB	0	54	549
WB	60	245	0	WB	31	389	0	WB	52%	159%		WB	81	1,074	0	WB	42	1,356	0

Intersection 13: I-680 NB Off / Bayshore**Existing P M Peak Period**
Turning Movement Volumes

	LT	TH	RT
NB	174	0	17
SB	0	0	0
EB	0	39	0
WB	0	130	0

1999 Count A M Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	359	0	100
SB	0	0	0
EB	0	78	0
WB	0	46	0

Differences between
A M and P M Peak Periods

	LT	TH	RT
NB	206%		588%
SB			
EB		200%	
WB		35%	

2010 P M Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	1,055	0	93
SB	0	0	0
EB	0	39	0
WB	0	130	0

Final 2010 A M Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	1,310	0	548
SB	0	0	0
EB	0	78	0
WB	0	46	0

Period =

P.M.

f Existing Counts =

1999

Year of Model Volumes =

1990

Year of Model Volumes =

2010

Section 1: E. Second / I-780 EB ramps1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	0	531	141
SB	125	540	0
EB	0	0	0
WB	147	0	152

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	438	107
SB	192	722	0
EB	0	0	0
WB	172	0	162

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	531	141
SB	192	722	0
EB	0	0	0
WB	172	0	162

Section 2: E. Second / I-780 WB ramps1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	240	395	0
SB	0	489	174
EB	0	0	0
WB	166	0	131

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	332	283	0
SB	0	213	335
EB	0	0	0
WB	666	0	348

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	332	395	0
SB	0	489	335
EB	0	0	0
WB	666	0	348

Section 3: E. Second / Rose1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	269	212	0
SB	0	312	141
EB	56	0	134
WB	0	0	0

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	454	291	0
SB	0	303	379
EB	113	0	120
WB	0	0	0

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	454	291	0
SB	0	312	379
EB	113	0	134
WB	0	0	0

Section 4: Industrial / E. Second1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	6	14	19
SB	111	17	88
EB	34	327	2
WB	3	161	90

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	600	0	28
SB	15	7	83
EB	0	362	94
WB	1	212	248

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	600	14	28
SB	111	17	88
EB	34	362	94
WB	3	212	248

Intersection 5: E. Second / Lake Herman1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	22	87	469
SB	20	20	9
EB	5	16	16
WB	275	42	55

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	117	73	536
SB	13	5	12
EB	20	19	12
WB	234	493	140

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	117	87	536
SB	20	20	12
EB	20	19	16
WB	275	493	140

Intersection 6: I-680 SB ramps / Lake Herman1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	14	0	160
EB	0	375	129
WB	120	209	0

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	33	0	223
EB	0	473	63
WB	114	643	0

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	33	0	223
EB	0	473	129
WB	120	643	0

Intersection 7: Goodyear - I-680 NB ramp / Lake Herman1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	140	3	22
SB	1	3	60
EB	27	40	320
WB	100	133	0

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	505	15	78
SB	2	0	4
EB	1	70	434
WB	258	249	0

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	505	15	78
SB	2	3	60
EB	27	70	434
WB	258	249	0

Intersection 8: Park / Industrial1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	111	64	96
SB	22	110	22
EB	36	98	135
WB	128	29	12

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	478	181	464
SB	58	421	6
EB	1	69	93
WB	547	98	203

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	478	181	464
SB	58	421	22
EB	36	98	135
WB	547	98	203

Intersection 9: I-680 SB Off / Industrial1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	11	0	38
EB	0	217	0
WB	0	134	0

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	9	0	86
EB	0	685	0
WB	0	669	0

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	11	0	86
EB	0	685	0
WB	0	669	0

Section 10: I-680 NB On / Industrial1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	171	55	0
WB	0	132	66

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	209	473	0
WB	0	660	15

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	209	473	0
WB	0	660	66

Section 11: Park / Bayshore1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	3	87	39
SB	283	27	4
EB	27	16	5
WB	38	15	190

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	26	132	1
SB	1,012	57	45
EB	50	98	44
WB	226	20	854

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	26	132	39
SB	1,012	57	45
EB	50	98	44
WB	226	20	854

Section 12: I-680 SB On / Bayshore1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	39	301
WB	60	245	0

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	17	1,102
WB	81	1,074	0

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	39	1,102
WB	81	1,074	0

Section 13: I-680 NB Off / Bayshore1999 Count P.M. Peak Period
Turning Movement Volumes

	LT	TH	RT
NB	174	0	17
SB	0	0	0
EB	0	39	0
WB	0	130	0

2010 Furnessed P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	1,055	0	93
SB	0	0	0
EB	0	17	0
WB	0	101	0

Final 2010 P.M. Peak Hour
Turning Movement Volumes

	LT	TH	RT
NB	1,055	0	93
SB	0	0	0
EB	0	39	0
WB	0	130	0

Benicia Business Park EIR
2010 Base Conditions
AM Peak Hour

Turning Movement Report
Tourtelot - AM Peak

Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#1 EAST SECOND / I-780 EB RAMP													
Base	0	312	176	406	404	0	0	0	0	217	0	288	1753
Added	0	9	0	46	28	0	0	0	0	0	0	20	103
Total	0	321	176	452	432	0	0	0	0	217	0	308	1856
#2 EAST SECOND / I-780 WB RAMP													
Base	249	335	0	0	432	304	0	0	0	413	0	406	2139
Added	0	29	0	0	75	62	0	0	0	0	0	15	181
Total	249	364	0	0	507	366	0	0	0	413	0	421	2320
#3 EAST SECOND / ROSE													
Base	169	332	0	0	230	105	300	0	358	0	0	0	1494
Added	45	0	0	0	0	6	18	0	136	0	0	0	205
Total	214	332	0	0	230	111	318	0	494	0	0	0	1699
#4 EAST SECOND / INDUSTRIAL													
Base	5	319	344	82	264	515	200	3	7	53	9	12	1813
Added	0	18	0	0	6	0	0	0	0	0	0	0	24
Total	5	337	344	82	270	515	200	3	7	53	9	12	1837
#5 EAST SECOND / LAKE HERMAN													
Base	16	8	242	1	15	3	8	45	29	392	1444	43	2246
Added	0	0	18	0	0	0	0	0	0	6	0	0	24
Total	16	8	260	1	15	3	8	45	29	398	1444	43	2270
#6 I-680 SB RAMP / LAKE HERMAN													
Base	0	0	0	102	0	553	0	246	57	61	431	0	1450
Added	0	0	0	0	0	6	0	18	0	0	0	0	24
Total	0	0	0	102	0	559	0	264	57	61	431	0	1474
#7 I-680 NB RAMP / LAKE HERMAN													
Base	465	332	237	9	3	14	29	165	126	85	146	0	1611
Added	0	0	0	0	0	0	0	0	18	0	0	0	18
Total	465	332	237	9	3	14	29	165	144	85	146	0	1629
#8 PARK / INDUSTRIAL													
Base	456	246	522	40	195	5	4	25	121	277	95	308	2294
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	456	246	522	40	195	5	4	25	121	277	95	308	2294
#9 I-680 SB OFF / INDUSTRIAL													
Base	0	0	0	57	0	395	0	587	0	0	285	0	1324
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	57	0	395	0	587	0	0	285	0	1324

Benicia Business Park EIR
2010 Base Conditions
AM Peak Hour

Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#10 I-680 NB ON / INDUSTRIAL													
Base	0	0	0	0	0	0	20	624	0	0	150	16	1010
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	20	624	0	0	150	16	1010
#11 PARK / BAYSHORE													
Base	78	23	16	633	140	729	18	49	44	243	30	1083	3086
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	78	23	16	633	140	729	18	49	44	243	30	1083	3086
#12 I-680 SB ON / BAYSHORE													
Base	0	0	0	0	0	0	0	54	549	42	1356	0	2001
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	54	549	42	1356	0	2001
#13 I-680 NB OFF / BAYSHORE													
Base	1310	0	548	0	0	0	0	78	0	0	46	0	1982
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1310	0	548	0	0	0	0	78	0	0	46	0	1982
#14													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	18	0	0	6	0	0	0	0	0	0	0	24
Total	0	18	0	0	6	0	0	0	0	0	0	0	24

Benicia Business Park EIR
2010 Base Conditions
PM Peak Hour

Turning Movement Report
Tourtlot - PM Peak

Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#1 EAST SECOND / I-780 EB RAMP													
Base	0	541	141	192	722	0	0	0	0	172	0	162	1920
Added	0	32	0	29	18	0	0	0	0	0	0	71	150
Total	0	563	141	221	740	0	0	0	0	172	0	233	2070
#2 EAST SECOND / I-780 WB RAMP													
Base	332	395	0	0	489	335	0	0	0	666	0	348	2565
Added	0	103	0	0	47	39	0	0	0	0	0	53	242
Total	332	498	0	0	536	374	0	0	0	666	0	401	2807
#3 EAST SECOND / ROSE													
Base	454	291	0	0	312	379	113	0	134	0	0	0	1683
Added	156	0	0	0	0	21	11	0	86	0	0	0	274
Total	610	291	0	0	312	400	124	0	220	0	0	0	1957
#4 EAST SECOND / INDUSTRIAL													
Base	61	462	94	3	212	248	111	17	88	600	14	28	1811
Added	0	11	0	0	21	0	0	0	0	0	0	0	32
Total	61	473	94	3	233	248	111	17	88	600	14	28	1843
#5 EAST SECOND / LAKE HERMAN													
Base	117	87	536	20	20	12	20	19	16	275	493	140	1755
Added	0	0	11	0	0	0	0	0	0	21	0	0	32
Total	117	87	547	20	20	12	20	19	16	296	493	140	1787
#6 I-680 SB RAMP / LAKE HERMAN													
Base	0	0	0	33	0	223	0	473	129	120	643	0	1621
Added	0	0	0	0	0	21	0	11	0	0	0	0	32
Total	0	0	0	33	0	244	0	484	129	120	643	0	1653
#7 I-680 NB RAMP / LAKE HERMAN													
Base	505	15	78	2	3	60	27	70	434	258	249	0	1701
Added	0	0	0	0	0	0	0	0	11	0	0	0	11
Total	505	15	78	2	3	60	27	70	445	258	249	0	1712
#8 PARK / INDUSTRIAL													
Base	478	181	464	58	421	22	36	98	135	547	98	203	2741
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	478	181	464	58	421	22	36	98	135	547	98	203	2741
#9 I-680 SB OFF / INDUSTRIAL													
Base	0	0	0	11	0	86	0	685	0	0	669	0	1451
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	11	0	86	0	685	0	0	669	0	1451

Benicia Business Park EIR
2010 Base Conditions
PM Peak Hour

Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#10 I-680 NB ON / INDUSTRIAL													
Base	0	0	0	0	0	0	0	209	473	0	0	660	1408
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	209	473	0	0	660	1408
#11 PARK / BAYSHORE													
Base	26	132	39	1012	57	45	50	98	44	226	20	854	2603
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	26	132	39	1012	57	45	50	98	44	226	20	854	2603
#12 I-680 SB ON / BAYSHORE													
Base	0	0	0	0	0	0	0	99	1102	81	1074	0	2296
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	99	1102	81	1074	0	2296
#13 I-680 NB OFF / BAYSHORE													
Base	1055	0	94	0	0	0	0	99	0	0	130	0	1317
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1055	0	94	0	0	0	0	99	0	0	130	0	1317
#14													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	11	0	0	21	0	0	0	0	0	0	0	32
Total	0	11	0	0	21	0	0	0	0	0	0	0	32

Benicia Business Park EIR
2010 Base Conditions
AM Peak HourLevel Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I-780 EB RAMP

Cycle (sec): 90 Critical Vol./Cap. (X): 0.620
 Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 15.4
 Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	20	20	5	30	0	0	0	0	15	0	15
Lanes:	0	0	2	0	1	1	0	2	0	0	0	1

Volume Module:												
Base Vol:	0	312	126	406	404	0	0	0	0	217	0	288
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	312	126	406	404	0	0	0	0	217	0	288
Added Vol:	0	9	0	46	28	0	0	0	0	0	0	20
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	321	126	452	432	0	0	0	0	217	0	308
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	338	133	476	455	0	0	0	0	228	0	324
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	338	133	476	455	0	0	0	0	228	0	324
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.00	1.00	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	355	133	476	477	0	0	0	0	228	0	324

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	3800	1615	1805	3800	0	0	0	0	1805	0	1615

Capacity Analysis Module:												
Vol/Sat:	0.00	0.09	0.08	0.26	0.13	0.00	0.00	0.00	0.00	0.13	0.00	0.20
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	0.0	20.0	20.0	34.6	54.6	0.0	0.0	0.0	0.0	26.4	0.0	26.4
Volume/Cap:	0.00	0.42	0.37	0.69	0.21	0.00	0.00	0.00	0.00	0.43	0.00	0.69
Delay/Veh:	0.0	19.6	19.5	16.9	5.1	0.0	0.0	0.0	0.0	17.0	0.0	21.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	19.6	19.5	16.9	5.1	0.0	0.0	0.0	0.0	17.0	0.0	21.0
DesignQueue:	0	14	5	16	10	0	0	0	0	8	0	12

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Intersection #2 EAST SECOND / I-780 WB RAMP

Cycle (sec): 100 Critical Vol./Cap. (X): 0.723
 Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 17.1
 Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	1	1	0	2	0	1	0

Volume Module: >> Count Date: 19 May 1999 <<												
Base Vol:	249	335	0	0	432	304	0	0	0	413	0	406
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	249	335	0	0	432	304	0	0	0	413	0	406
Added Vol:	0	29	0	0	75	62	0	0	0	0	0	15
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	249	364	0	0	507	366	0	0	0	413	0	421
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	262	383	0	0	534	385	0	0	0	435	0	443
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	262	383	0	0	534	385	0	0	0	435	0	443
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.05	1.00	1.05	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol.:	262	402	0	0	560	385	0	0	0	448	0	443

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	1.00	2.00	0.00	1.00	2.00	1.00	0.00	0.00	0.00	2.00	1.00	1.00
Final Sat.:	1805	3800	0	1900	3800	1615	0	0	0	3610	1900	1615

Capacity Analysis Module:												
Vol/Sat:	0.15	0.11	0.00	0.00	0.15	0.24	0.00	0.00	0.00	0.12	0.00	0.27
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	20.1	53.1	0.0	0.0	33.0	33.0	0.0	0.0	0.0	37.9	0.0	37.9
Volume/Cap:	0.72	0.20	0.00	0.00	0.45	0.72	0.00	0.00	0.00	0.33	0.00	0.72
Delay/Veh:	28.9	8.0	0.0	0.0	17.2	22.4	0.0	0.0	0.0	14.3	0.0	20.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.9	8.0	0.0	0.0	17.2	22.4	0.0	0.0	0.0	14.3	0.0	20.1
DesignQueue:	12	11	0	0	22	15	0	0	0	16	0	16

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Intersection #3 EAST SECOND / ROSE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.473
Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 13.4
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	2	0	2	0	0	2	0	0	0	1	0	0

Volume Module: >> Count Date: 19 May 1999 <<
Base Vol: 169 332 0 0 230 105 300 0 358 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 169 332 0 0 230 105 300 0 358 0 0 0
Added Vol: 45 0 0 0 0 0 6 18 0 136 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 214 332 0 0 230 111 318 0 494 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 214 332 0 0 230 111 318 0 494 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 214 332 0 0 230 111 318 0 494 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.03 1.05 1.00 1.00 1.05 1.00 1.03 1.00 1.00 1.00 1.00 1.00
Final Vol.: 220 349 0 0 242 111 328 0 494 0 0 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 1.00 1.00 0.85 0.95 1.00 0.85 1.00 1.00 1.00
Lanes: 2.00 2.00 0.00 0.00 2.00 1.00 2.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 3610 3800 0 0 3800 1615 3610 0 1615 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.06 0.09 0.00 0.00 0.06 0.07 0.09 0.00 0.31 0.00 0.00 0.00
Crit Moves: ****
Green Time: 11.8 31.8 0.0 0.0 20.0 79.2 59.2 0.0 59.2 0.0 0.0 0.0
Volume/Cap: 0.52 0.29 0.00 0.00 0.32 0.09 0.15 0.00 0.52 0.00 0.00 0.00
Delay/Veh: 27.7 16.6 0.0 0.0 22.2 1.5 5.9 0.0 8.2 0.0 0.0 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 27.7 16.6 0.0 0.0 22.2 1.5 5.9 0.0 8.2 0.0 0.0 0.0
DesignQueue: 11 14 0 0 11 1 8 0 12 0 0 0

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Intersection #4 EAST SECOND / INDUSTRIAL

Cycle (sec): 120 Critical Vol./Cap. (X): 0.405
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 13.8
Optimal Cycle: 73 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Include			Include		
Min. Green:	5	20	20	5	20	20	18	18	18	18	18	18
Lanes:	1	0	1	0	1	0	1	0	1	0	2	0

Volume Module:
Base Vol: 5 319 344 82 264 515 200 3 7 53 9 12
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 319 344 82 264 515 200 3 7 53 9 12
Added Vol: 0 18 0 0 6 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 5 337 344 82 270 515 200 3 7 53 9 12
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 5 355 362 86 284 542 211 3 7 56 9 13
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 5 355 362 86 284 542 211 3 7 56 9 13
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.03 1.00 1.00
Final Vol.: 5 355 362 86 284 542 211 3 7 57 9 13

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.95 0.90 0.90 0.95 0.91 0.91
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.30 0.70 2.00 0.41 0.59
Final Sat.: 1805 1900 1615 1805 1900 1615 1805 513 1197 3610 707 1022

Capacity Analysis Module:
Vol/Sat: 0.00 0.19 0.22 0.05 0.15 0.34 0.12 0.01 0.01 0.02 0.01 0.01
Crit Moves: ****
Green Time: 5.0 47.9 71.8 12.2 55.1 85.0 29.9 24.0 24.0 24.0 18.0 18.0
Volume/Cap: 0.07 0.47 0.37 0.47 0.33 0.47 0.47 0.03 0.03 0.08 0.08 0.08
Delay/Veh: 35.7 17.6 8.2 34.3 13.4 5.2 25.3 25.0 25.0 25.2 28.4 28.4
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 35.7 17.6 8.2 34.3 13.4 5.2 25.3 25.0 25.0 25.2 28.4 28.4
DesignQueue: 0 15 10 5 11 11 11 0 0 3 1 1

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Intersection #5 EAST SECOND / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.554
Loss Time (sec): 12 (Y+K = 4 sec) Average Delay (sec/veh): 4.3
Optimal Cycle: 70 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Ovl	Include	Ovl	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	2 0 1 0 1	1 0 0 1 0	1 0 2 0 1	2 0 1 1 0

Volume Module:

Base Vol:	16	8	242	1	15	3	8	45	29	392	1444	43
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	8	242	1	15	3	8	45	29	392	1444	43
Added Vol:	0	0	18	0	0	0	0	0	0	6	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	16	8	260	1	15	3	8	45	29	398	1444	43
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	17	8	274	1	16	3	8	47	31	419	1520	45
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	17	8	274	1	16	3	8	47	31	419	1520	45
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLE Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.05	1.05
Final Vol.:	17	8	274	1	16	3	8	50	31	432	1596	48

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.98	0.98	0.95	1.00	0.85	0.95	1.00	1.00
Lanes:	2.00	1.00	1.00	1.00	0.84	0.16	1.00	2.00	1.00	2.00	1.94	0.06
Final Sat.:	3610	1900	1615	1805	1568	294	1805	3800	1615	3610	3689	111

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.17	0.00	0.01	0.01	0.00	0.01	0.02	0.12	0.43	0.43
Crit Moves:	****	****					****			****		
Green Time:	2.9	0.0	79.4	0.1	6.2	6.2	0.8	8.5	11.4	70.4	78.1	78.1
Volume/Cap:	0.16	0.05	0.21	0.55	0.16	0.16	0.55	0.15	0.17	0.17	0.55	0.55
Delay/Veh:	30.7	26.8	1.7	128.7	28.7	28.7	56.1	27.4	25.9	3.2	2.9	2.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.7	26.8	1.7	128.7	28.7	28.7	56.1	27.4	25.9	3.2	2.9	2.9
DesignQueue:	1	0	3	0	1	0	0	3	2	7	22	1

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Intersection #6 I-680 SB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.663
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 15.5
Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 0 0 0 0	1 0 0 0 1	0 0 2 0 1	2 0 1 0 0

Volume Module: >> Count date: 20 May 1999 <<

Base Vol:	0	0	0	102	0	553	0	246	57	61	431	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	102	0	553	0	246	57	61	431	0
Added Vol:	0	0	0	0	0	6	0	18	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	102	0	559	0	264	57	61	431	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	107	0	588	0	278	60	64	454	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	107	0	588	0	278	60	64	454	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.00	1.00
Final Vol.:	0	0	0	107	0	588	0	292	60	66	454	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	2.00	1.00	0.00
Final Sat.:	0	0	0	1805	0	1615	0	3800	1615	3610	1900	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.06	0.00	0.36	0.00	0.08	0.04	0.02	0.24	0.00
Crit Moves:	****	****				****				****		
Green Time:	0.0	0.0	0.0	54.9	0.0	54.9	0.0	29.1	29.1	6.9	36.1	0.0
Volume/Cap:	0.00	0.00	0.00	0.11	0.00	0.66	0.00	0.26	0.13	0.26	0.66	0.00
Delay/Veh:	0.0	0.0	0.0	7.0	0.0	11.6	0.0	17.6	16.9	28.6	19.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	7.0	0.0	11.6	0.0	17.6	16.9	28.6	19.0	0.0
DesignQueue:	0	0	0	3	0	16	0	12	2	9	17	0

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Intersection #7 I-680 NB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.542
Loss Time (sec): 9 (Y/R - 4 sec) Average Delay (sec/veh): 14.3
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 0 1 0	0 0 1 0 0	1 0 1 0 1	1 0 0 1 0

Volume Module: >> Count Date: 20 May 1999 <<

Base Vol:	465	332	237	9	3	14	29	165	126	85	146	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	465	332	237	9	3	14	29	165	126	85	146	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	465	332	237	9	3	14	29	165	144	85	146	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	489	349	249	9	3	15	31	174	152	89	154	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	489	349	249	9	3	15	31	174	152	89	154	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	489	349	249	9	3	15	31	174	152	89	154	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.80	0.80	0.80	0.95	1.00	0.85	0.95	1.00	1.00
Lanes:	1.00	0.58	0.42	0.33	0.11	0.56	1.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	1805	1042	744	509	170	848	1805	1900	1615	1805	1900	0

Capacity Analysis Module:

Vol/Sat:	0.27	0.33	0.33	0.02	0.02	0.02	0.02	0.09	0.09	0.05	0.08	0.00
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	61.0	61.8	61.8	3.3	4.0	4.0	4.5	16.9	16.9	9.1	21.4	0.0
Volume/Cap:	0.44	0.54	0.54	0.54	0.44	0.44	0.38	0.54	0.56	0.54	0.38	0.00
Delay/Veh:	6.9	7.5	7.5	39.0	33.6	33.6	31.3	26.0	26.5	30.8	22.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.9	7.5	7.5	39.0	33.6	33.6	31.3	26.0	26.5	30.8	22.0	0.0
DesignQueue:	11	8	6	0	0	1	2	8	7	5	7	0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #8 PARK / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.712
Loss Time (sec): 12 (Y/R - 4 sec) Average Delay (sec/veh): 15.8
Optimal Cycle: 61 Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Ovl	Include	Ovl	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 1 0 1	1 0 1 0 1	1 0 1 0 1	2 0 0 1 0

Volume Module:

Base Vol:	456	246	522	40	195	5	4	25	121	277	95	308
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	456	246	522	40	195	5	4	25	121	277	95	308
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	456	246	522	40	195	5	4	25	121	277	95	308
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	480	259	549	42	205	5	4	26	127	292	100	324
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	480	259	549	42	205	5	4	26	127	292	100	324
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol.:	480	259	549	42	205	5	4	26	127	300	100	324

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.89	0.89
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	0.24	0.76
Final Sat.:	1805	1900	1615	1805	1900	1615	1805	1900	1615	3610	399	1292

Capacity Analysis Module:

Vol/Sat:	0.27	0.14	0.34	0.02	0.11	0.00	0.00	0.01	0.08	0.08	0.25	0.25
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	37.3	48.1	78.6	4.4	15.1	15.1	0.3	5.0	42.4	30.5	35.2	35.2
Volume/Cap:	0.71	0.28	0.43	0.53	0.71	0.02	0.71	0.27	0.19	0.27	0.71	0.71
Delay/Veh:	19.7	10.1	2.4	35.4	31.5	23.3	134.5	29.9	11.7	17.1	20.9	20.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	19.7	10.1	2.4	35.4	31.5	23.3	134.5	29.9	11.7	17.1	20.9	20.9
DesignQueue:	18	8	7	2	10	0	0	1	4	12	4	12

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Level of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-680 SR OFF / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.640
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 13.2
Optimal Cycle: 60 Level of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module: >> Count Date: 20 May 1999 <<
Base Vol: 0 0 0 57 0 395 0 587 0 0 285 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 0 0 57 0 395 0 587 0 0 285 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 0 0 57 0 395 0 587 0 0 285 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 0 0 0 60 0 416 0 618 0 0 300 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 0 0 60 0 416 0 618 0 0 300 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 0 0 0 60 0 416 0 618 0 0 300 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 1.00 1.00 1.00 0.95 1.00 0.85 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.00 0.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 0.00 1.00 0.00
Final Sat.: 0 0 0 1805 0 1615 0 1900 0 0 1900 0

Capacity Analysis Module:
Vol/Sat: 0.00 0.00 0.00 0.03 0.00 0.26 0.00 0.33 0.00 0.00 0.16 0.00
Crit Moves: ****
Green Time: 0.0 0.0 0.0 40.2 0.0 40.2 0.0 50.8 0.0 0.0 50.8 0.0
Volume/Cap: 0.00 0.00 0.00 0.08 0.00 0.64 0.00 0.64 0.00 0.00 0.31 0.00
Delay/Veh: 0.0 0.0 0.0 11.9 0.0 17.1 0.0 12.6 0.0 0.0 9.4 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 0.0 0.0 11.9 0.0 17.1 0.0 12.6 0.0 0.0 9.4 0.0
DesignQueue: 0 0 0 2 0 15 0 18 0 0 9 0

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Level of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #10 I-680 NB ON / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.380
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 1.2
Optimal Cycle: 60 Level of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module:
Base Vol: 0 0 0 0 0 0 20 624 0 0 350 16
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 0 0 0 0 0 20 624 0 0 350 16
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 0 0 0 0 0 20 624 0 0 350 16
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 0 0 0 0 0 0 21 657 0 0 368 17
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 0 0 0 0 0 21 657 0 0 368 17
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 0 0 0 0 0 0 21 657 0 0 368 17

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 0.95 1.00 1.00 1.00 1.00 0.85
Lanes: 0.00 0.00 0.00 0.00 0.00 0.00 1.00 1.00 0.00 0.00 1.00 1.00
Final Sat.: 0 0 0 0 0 0 1805 1900 0 0 1900 1615

Capacity Analysis Module:
Vol/Sat: 0.00 0.00 0.00 0.00 0.00 0.00 0.01 0.35 0.00 0.00 0.19 0.01
Crit Moves: ****
Green Time: 0.0 0.0 0.0 0.0 0.0 0.0 5.2 91.0 0.0 0.0 85.8 85.8
Volume/Cap: 0.00 0.00 0.00 0.00 0.00 0.00 0.23 0.38 0.00 0.00 0.23 0.01
Delay/Veh: 0.0 0.0 0.0 0.0 0.0 0.0 29.6 0.5 0.0 0.0 0.8 0.7
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 0.0 0.0 0.0 0.0 0.0 29.6 0.5 0.0 0.0 0.8 0.7
DesignQueue: 0 0 0 0 0 0 1 4 0 0 3 0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #11 PARK / RAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.801
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 11.9
Optimal Cycle: 69 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ovl			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	1	0	0	2	0	1	0	0	2

Volume Module:	North Bound			South Bound			East Bound			West Bound		
Base Vol:	78	23	16	633	140	729	18	49	44	243	30	1083
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	23	16	633	140	729	18	49	44	243	30	1083
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	23	16	633	140	729	18	49	44	243	30	1083
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	82	24	17	666	147	767	19	52	46	256	32	1140
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	24	17	666	147	767	19	52	46	256	32	1140
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.13
Final Vol.:	82	24	17	686	147	767	19	52	46	256	32	1288

Saturation Flow Module:	North Bound			South Bound			East Bound			West Bound		
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	1.00	0.85	0.84	0.84	0.84	0.96	0.96	0.85
Lanes:	1.00	0.59	0.41	2.00	1.00	1.00	0.16	0.45	0.39	0.89	0.11	2.00
Final Sat.:	1805	1045	741	3610	1900	1615	260	711	629	1621	203	3230

Capacity Analysis Module:	North Bound			South Bound			East Bound			West Bound		
Vol/Sat:	0.05	0.02	0.02	0.19	0.08	0.47	0.07	0.07	0.07	0.16	0.16	0.40
Crit Moves:	****			****			****			****		
Green Time:	5.7	6.0	6.0	49.8	50.1	59.3	9.1	9.1	9.1	26.1	26.1	75.9
Volume/Cap:	0.80	0.38	0.38	0.38	0.15	0.80	0.80	0.80	0.80	0.61	0.61	0.53
Delay/Veh:	53.1	30.3	30.3	10.1	8.7	13.7	46.3	46.3	46.3	22.6	22.6	3.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.1	30.3	30.3	10.1	8.7	13.7	46.3	46.3	46.3	22.6	22.6	3.3
DesignQueue:	4	1	1	20	4	19	1	3	2	11	1	19

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #12 I-680 SB ON / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.799
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 2.5
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	1	0	1	0

Volume Module:	North Bound			South Bound			East Bound			West Bound		
Base Vol:	0	0	0	0	0	0	0	54	549	42	1356	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	54	549	42	1356	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	0	54	549	42	1356	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	0	57	578	44	1427	0
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	0	57	578	44	1427	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	0	0	57	578	44	1427	0

Saturation Flow Module:	North Bound			South Bound			East Bound			West Bound		
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	0	0	0	0	0	0	0	1900	1615	1805	1900	0

Capacity Analysis Module:	North Bound			South Bound			East Bound			West Bound		
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.36	0.02	0.75	0.00
Crit Moves:	****			****			****			****		
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.0	88.0	6.0	94.0	0.0
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.41	0.41	0.80	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8	30.6	2.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8	30.6	2.4	0.0
DesignQueue:	0	0	0	0	0	0	0	0	4	2	6	0

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Level Of Service Computation Report

1994 HCM Operations Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.464
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 3.0
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	0	0	0	0	1	0	0	0

Volume Module:

Base Vol:	1310	0	548	0	0	0	0	78	0	0	46	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1310	0	548	0	0	0	0	78	0	0	46	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1310	0	548	0	0	0	0	78	0	0	46	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1379	0	577	0	0	0	0	82	0	0	48	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1379	0	577	0	0	0	0	82	0	0	48	0
FCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLE Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00
Final Vol.:	1420	0	577	0	0	0	0	82	0	0	51	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.00
Final Sat.:	3610	0	1615	0	0	0	0	1900	0	0	3800	0

Capacity Analysis Module:

Vol/Sat:	0.39	0.00	0.36	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00
Crit Moves:	****			****			****			****		
Green Time:	84.7	0.0	84.7	0.0	0.0	0.0	0.0	9.3	0.0	0.0	9.3	0.0
Volume/Cap:	0.46	0.00	0.42	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.14	0.00
Delay/Veh:	1.3	0.0	1.3	0.0	0.0	0.0	0.0	29.2	0.0	0.0	27.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.3	0.0	1.3	0.0	0.0	0.0	0.0	29.2	0.0	0.0	27.0	0.0
DesignQueue:	13	0	5	0	0	0	0	4	0	0	3	0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I-780 EB RAMP

Cycle (sec): 90 Critical Vol./Cap. (X): 0.437
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 12.0
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 20 20	5 30 0	0 0 0	15 0 15
Lanes:	0 0 2 0 1	1 0 2 0 0	0 0 0 0 0	1 0 0 0 1

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	531	141	192	722	0	0	0	0	172	0	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	531	141	192	722	0	0	0	0	172	0	162
Added Vol:	0	42	0	29	18	0	0	0	0	0	0	71
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	563	141	221	740	0	0	0	0	172	0	233
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	593	148	233	779	0	0	0	0	181	0	245
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	593	148	233	779	0	0	0	0	181	0	245
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.00	1.00	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	622	148	233	818	0	0	0	0	181	0	245

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	3800	1615	1805	3800	0	0	0	0	1805	0	1615

Capacity Analysis Module:

Vol/Sat:	0.00	0.16	0.09	0.13	0.22	0.00	0.00	0.00	0.00	0.10	0.00	0.15
Crit Moves:	0.00	0.16	0.09	0.13	0.22	0.00	0.00	0.00	0.00	0.10	0.00	0.15
Green Time:	0.0	33.7	33.7	26.6	60.3	0.0	0.0	0.0	0.0	20.7	0.0	20.7
Volume/Cap:	0.00	0.44	0.24	0.44	0.32	0.00	0.00	0.00	0.00	0.44	0.00	0.66
Delay/Veh:	0.0	13.7	12.6	16.9	4.1	0.0	0.0	0.0	0.0	19.7	0.0	23.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	13.7	12.6	16.9	4.1	0.0	0.0	0.0	0.0	19.7	0.0	23.3
DesignQueue:	0	20	5	8	14	0	0	0	0	7	0	10

Benicia Business Park EIR
2010 Base Conditions
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #2 EAST SECOND / I-780 WB RAMP

Cycle (sec): 100 Critical Vol./Cap. (X): 0.768
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 18.8
Optimal Cycle: 62 Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 1 1 0	1 0 2 0 1	0 0 0 0 0	2 0 1 0 1

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM

Base Vol:	332	395	0	0	489	335	0	0	0	666	0	348
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	332	395	0	0	489	335	0	0	0	666	0	348
Added Vol:	0	104	0	0	47	49	0	0	0	0	0	54
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	332	499	0	0	536	374	0	0	0	666	0	401
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	349	524	0	0	564	394	0	0	0	701	0	422
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	349	524	0	0	564	394	0	0	0	701	0	422
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.05	1.00	1.05	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol.:	349	550	0	0	592	394	0	0	0	722	0	422

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	1.00	2.00	0.00	1.00	2.00	1.00	0.00	0.00	0.00	2.00	1.00	1.00
Final Sat.:	1805	3800	0	1900	3800	1615	0	0	0	3610	1900	1615

Capacity Analysis Module:

Vol/Sat:	0.19	0.14	0.00	0.00	0.16	0.24	0.00	0.00	0.00	0.20	0.00	0.26
Crit Moves:	0.19	0.14	0.00	0.00	0.16	0.24	0.00	0.00	0.00	0.20	0.00	0.26
Green Time:	25.2	57.0	0.0	0.0	31.8	31.8	0.0	0.0	0.0	34.0	0.0	34.0
Volume/Cap:	0.77	0.25	0.00	0.00	0.49	0.77	0.00	0.00	0.00	0.59	0.00	0.77
Delay/Veh:	27.7	7.0	0.0	0.0	18.1	24.7	0.0	0.0	0.0	18.1	0.0	23.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.7	7.0	0.0	0.0	18.1	24.7	0.0	0.0	0.0	18.1	0.0	23.5
DesignQueue:	15	14	0	0	23	16	0	0	0	28	0	16

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection W3 EAST SECOND / ROSE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.416
Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 14.2
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	2	0	2	0	0	2	0	0	0	1	0	0

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM
Base Vol: 454 291 0 0 312 379 113 0 134 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 454 291 0 0 312 379 113 0 134 0 0 0
Added Vol: 156 0 0 0 0 0 21 11 0 86 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 610 291 0 0 312 400 124 0 220 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 610 291 0 0 312 400 124 0 220 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 610 291 0 0 312 400 124 0 220 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.03 1.05 1.00 1.00 1.05 1.00 1.03 1.00 1.00 1.00 1.00 1.00
Final Vol.: 628 306 0 0 328 400 128 0 220 0 0 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 1.00 1.00 1.00 0.85 0.95 1.00 0.85 1.00 1.00 1.00
Lanes: 2.00 2.00 0.00 0.00 2.00 1.00 2.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 3610 3800 0 0 3800 1615 3610 0 1615 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.17 0.08 0.00 0.00 0.09 0.25 0.04 0.00 0.14 0.00 0.00 0.00
Crit Moves: ****
Green Time: 39.8 59.8 0.0 0.0 20.0 51.2 31.2 0.0 31.2 0.0 0.0 0.0
Volume/Cap: 0.44 0.13 0.00 0.00 0.43 0.48 0.11 0.00 0.44 0.00 0.00 0.00
Delay/Veh: 14.3 5.7 0.0 0.0 22.9 10.6 15.9 0.0 18.1 0.0 0.0 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 14.3 5.7 0.0 0.0 22.9 10.6 15.9 0.0 18.1 0.0 0.0 0.0
DesignQueue: 22 7 0 0 15 11 5 0 9 0 0 0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection W4 EAST SECOND / INDUSTRIAL

Cycle (sec): 120 Critical Vol./Cap. (X): 0.507
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 19.2
Optimal Cycle: 73 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Include			Include		
Min. Green:	5	20	20	5	20	20	18	18	18	18	18	18
Lanes:	1	0	1	0	1	0	1	0	1	0	2	0

Volume Module: 4:00 - 6:00 PM
Base Vol: 34 362 94 3 212 248 111 17 88 600 14 28
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 34 362 94 3 212 248 111 17 88 600 14 28
Added Vol: 0 11 0 0 0 21 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 34 373 94 3 233 248 111 17 88 600 14 28
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 36 393 99 3 245 261 117 18 93 632 15 29
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 36 393 99 3 245 261 117 18 93 632 15 29
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.03 1.00 1.00
Final Vol.: 36 393 99 3 245 261 117 18 93 651 15 29

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.95 0.87 0.87 0.95 0.90 0.90
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.16 0.84 2.00 0.34 0.66
Final Sat.: 1805 1900 1615 1805 1900 1615 1805 268 1385 3610 583 1127

Capacity Analysis Module:
Vol/Sat: 0.02 0.21 0.06 0.00 0.13 0.16 0.06 0.07 0.07 0.18 0.03 0.03
Crit Moves: ****
Green Time: 10.1 45.4 85.0 5.0 40.3 69.1 28.8 18.0 18.0 39.6 28.8 28.8
Volume/Cap: 0.24 0.55 0.09 0.04 0.38 0.28 0.27 0.45 0.45 0.55 0.11 0.11
Delay/Veh: 33.3 19.6 3.5 35.7 19.8 8.4 24.0 30.9 30.9 21.6 23.0 23.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 33.3 19.6 3.5 35.7 19.8 8.4 24.0 30.9 30.9 21.6 23.0 23.0
DesignQueue: 2 17 2 0 11 8 6 1 5 30 1 1

Benicia Business Park EIR
2010 Base Conditions
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #5 EAST SECOND / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.546
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 12.4
Optimal Cycle: 70 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	2	0	1	0

Volume Module: 4:00 - 6:00 PM
Base Vol: 117 87 536 20 20 12 20 19 16 275 493 140
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 117 87 536 20 20 12 20 19 16 275 493 140
Added Vol: 0 0 11 0 0 0 0 0 0 21 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 117 87 547 20 20 12 20 19 16 296 493 140
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 123 92 576 21 21 13 21 20 17 312 519 147
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 123 92 576 21 21 13 21 20 17 312 519 147
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.03 1.00 1.00 1.00 1.00 1.00 1.00 1.05 1.00 1.03 1.05 1.05
Final Vol.: 127 92 576 21 21 13 21 21 17 321 545 155

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 0.94 0.94 0.95 1.00 0.85 0.95 0.97 0.97
Lanes: 2.00 1.00 1.00 1.00 0.62 0.38 1.00 2.00 1.00 2.00 1.56 0.44
Final Sat.: 3610 1900 1615 1805 1103 683 1805 3800 1615 3610 2870 816

Capacity Analysis Module:
Vol/Sat: 0.04 0.05 0.36 0.01 0.02 0.02 0.01 0.01 0.01 0.09 0.19 0.19
Crit Moves: ****
Green Time: 31.2 49.0 83.7 2.1 17.9 17.9 2.1 2.2 35.3 34.7 34.8 34.8
Volume/Cap: 0.11 0.10 0.43 0.55 0.11 0.11 0.55 0.26 0.03 0.26 0.55 0.55
Delay/Veh: 15.0 8.8 1.5 41.9 22.2 22.2 41.9 31.5 13.7 15.1 17.4 17.4
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 15.0 8.8 1.5 41.9 22.2 22.2 41.9 31.5 13.7 15.1 17.4 17.4
DesignQueue: 5 3 6 1 1 1 1 1 1 12 21 6

Benicia Business Park EIR
2010 Base Conditions
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #6 I-680 SB RAMPS / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.566
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 11.6
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	1	0	0	1	0	0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM
Base Vol: 0 0 0 33 0 223 0 473 129 120 643 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 0 0 33 0 223 0 473 129 120 643 0
Added Vol: 0 0 0 0 0 21 0 11 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 0 0 33 0 244 0 484 129 120 643 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 0 0 0 35 0 257 0 509 136 126 677 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 0 0 35 0 257 0 509 136 126 677 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.05 1.00 1.03 1.00 1.00
Final Vol.: 0 0 0 35 0 257 0 535 136 130 677 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 1.00 1.00 1.00 0.95 1.00 0.85 1.00 1.00 0.85 0.95 1.00 1.00
Lanes: 0.00 0.00 0.00 1.00 0.00 1.00 0.00 2.00 1.00 2.00 1.00 0.00
Final Sat.: 0 0 0 1805 0 1615 0 3800 1615 3610 1900 0

Capacity Analysis Module:
Vol/Sat: 0.00 0.00 0.00 0.02 0.00 0.16 0.00 0.14 0.08 0.04 0.36 0.00
Crit Moves: ****
Green Time: 0.0 0.0 0.0 28.1 0.0 28.1 0.0 50.1 50.1 12.8 62.9 0.0
Volume/Cap: 0.00 0.00 0.00 0.07 0.00 0.57 0.00 0.28 0.17 0.28 0.57 0.00
Delay/Veh: 0.0 0.0 0.0 17.0 0.0 21.1 0.0 9.4 8.8 25.6 7.4 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 0.0 0.0 17.0 0.0 21.1 0.0 9.4 8.8 25.6 7.4 0.0
DesignQueue: 0 0 0 1 0 11 0 15 4 6 15 0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #7 I-680 NB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.859
Loss Time (sec): 9 (Y/R = 4 sec) Average Delay (sec/veh): 28.2
Optimal Cycle: 85 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	1	0	0	1	0	1	1	0	0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM												
Base Vol:	505	15	78	2	3	60	27	70	434	258	249	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	505	15	78	2	3	60	27	70	434	258	249	0
Added Vol:	0	0	0	0	0	0	0	0	11	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	505	15	78	2	3	60	27	70	445	258	249	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	532	16	82	2	3	63	28	74	468	272	262	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	532	16	82	2	3	63	28	74	468	272	262	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	532	16	82	2	3	63	28	74	468	272	262	0

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.77	0.77	0.77	0.95	1.00	0.85	0.95	1.00	1.00
Lanes:	1.00	0.16	0.84	0.03	0.04	0.93	1.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	1805	270	1383	43	65	1355	1805	1900	1615	1805	1900	0

Capacity Analysis Module:												
Vol/Sat:	0.29	0.06	0.06	0.05	0.05	0.05	0.02	0.04	0.29	0.15	0.14	0.00
Crit Moves:	****			****			****			****		
Green Time:	34.3	22.3	22.3	17.5	5.4	5.4	5.2	33.7	33.7	17.5	46.1	0.0
Volume/Cap:	0.86	0.27	0.27	0.27	0.86	0.86	0.30	0.12	0.86	0.86	0.30	0.00
Delay/Veh:	27.9	20.8	20.8	23.2	68.5	68.5	30.0	14.8	29.1	40.0	10.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.9	20.8	20.8	23.2	68.5	68.5	30.0	14.8	29.1	40.0	10.9	0.0
DesignQueue:	21	1	4	0	0	3	1	3	18	13	8	0

Benicia Business Park EIR
2010 Base Conditions
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #8 PARK / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.840
Loss Time (sec): 12 (Y/R = 4 sec) Average Delay (sec/veh): 24.0
Optimal Cycle: 85 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	1	1	0	1	2	0	1

Volume Module: 4:00 - 6:00 PM												
Base Vol:	478	181	464	58	421	22	36	98	135	547	98	203
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	478	181	464	58	421	22	36	98	135	547	98	203
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	478	181	464	58	421	22	36	98	135	547	98	203
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	503	191	488	61	443	23	38	103	142	576	103	214
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	503	191	488	61	443	23	38	103	142	576	103	214
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol.:	503	191	488	61	443	23	38	103	142	593	103	214

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	0.32	0.68
Final Sat.:	1805	1900	1615	1805	1900	1615	1805	1900	1615	1610	556	1154

Capacity Analysis Module:												
Vol/Sat:	0.28	0.10	0.30	0.03	0.23	0.01	0.02	0.05	0.09	0.16	0.19	0.19
Crit Moves:	****			****			****			****		
Green Time:	34.6	49.5	69.3	12.1	28.1	28.1	2.7	6.5	40.1	19.8	24.6	24.6
Volume/Cap:	0.83	0.20	0.44	0.28	0.83	0.05	0.78	0.83	0.22	0.83	0.78	0.78
Delay/Veh:	26.4	9.2	4.5	26.0	29.1	16.9	67.1	53.5	12.7	30.6	29.8	29.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.4	9.2	4.5	26.0	29.1	16.9	67.1	53.5	12.7	30.6	29.8	29.8
DesignQueue:	20	6	9	3	19	1	2	5	5	28	5	9

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-680 SB OFF / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.479
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 4.1
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
Lanes:	0 0 0 0 0	1 0 0 0 1	0 0 1 0 0	0 0 1 0 0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	0	0	0	11	0	86	0	685	0	0	669	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	11	0	86	0	685	0	0	669	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	11	0	86	0	685	0	0	669	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	12	0	91	0	721	0	0	704	0
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	12	0	91	0	721	0	0	704	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	12	0	91	0	721	0	0	704	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Final Sat:	0	0	0	1805	0	1615	0	1900	0	0	1900	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.06	0.00	0.38	0.00	0.00	0.37	0.00
Crit Moves:						****		****			****	
Green Time:	0.0	0.0	0.0	11.8	0.0	11.8	0.0	79.2	0.0	0.0	79.2	0.0
Volume/Cap:	0.00	0.00	0.00	0.06	0.00	0.48	0.00	0.48	0.00	0.00	0.47	0.00
Delay/Veh:	0.0	0.0	0.0	25.3	0.0	28.1	0.0	2.4	0.0	0.0	2.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	25.3	0.0	28.1	0.0	2.4	0.0	0.0	2.4	0.0
DesignQueue:	0	0	0	1	0	5	0	9	0	0	9	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #10 I-680 NB ON / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.546
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 6.3
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
Lanes:	0 0 0 0 0	0 0 0 0 0	1 0 1 0 0	0 0 1 0 1

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	0	0	0	0	209	473	0	0	660	66
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	209	473	0	0	660	66
Added Vol:	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	209	473	0	0	660	66
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	200	498	0	0	695	69
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	200	498	0	0	695	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	0	0	200	498	0	0	695	69

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.85
Lanes:	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Final Sat:	0	0	0	0	0	1805	1900	0	0	1900	1615

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.12	0.26	0.00	0.00	0.37	0.04
Crit Moves:						****	****			****	
Green Time:	0.0	0.0	0.0	0.0	0.0	22.7	91.0	0.0	0.0	68.4	68.4
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.54	0.29	0.00	0.00	0.54	0.06
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	23.0	0.4	0.0	0.0	5.5	1.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	23.0	0.4	0.0	0.0	5.5	1.4
DesignQueue:	0	0	0	0	0	10	3	0	0	14	1

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #11 PARK / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.733
Loss Time (sec): 9 (Y/R = 4 sec) Average Delay (sec/veh): 16.8
Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Ovl	Include	Ovl
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 0 1 0	2 0 1 0 1	0 0 1 0 0	0 1 0 0 2

Volume Module: 4:00 - 6:00 PM

Base Vol:	26	132	39	1012	57	45	50	98	44	226	20	854
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	132	39	1012	57	45	50	98	44	226	20	854
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	26	132	39	1012	57	45	50	98	44	226	20	854
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	27	139	41	1065	60	47	53	103	46	238	21	899
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	139	41	1065	60	47	53	103	46	238	21	899
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.13
Final Vol.:	27	139	41	1097	60	47	53	103	46	238	21	1016

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.97	0.97	0.95	1.00	0.85	0.86	0.86	0.86	0.96	0.96	0.85
Lanes:	1.00	0.77	0.23	2.00	1.00	1.00	0.26	0.51	0.23	0.92	0.08	2.00
Final Sat.:	1805	1423	420	3610	1900	1615	429	834	373	1676	148	3230

Capacity Analysis Module:

Vol/Sat:	0.01	0.10	0.10	0.30	0.03	0.03	0.12	0.12	0.12	0.14	0.14	0.31
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	17.6	13.3	13.3	41.5	37.2	54.0	16.8	16.8	16.8	19.4	19.4	60.8
Volume/Cap:	0.08	0.73	0.73	0.73	0.08	0.05	0.73	0.73	0.73	0.73	0.73	0.52
Delay/Veh:	22.3	34.1	34.1	17.2	13.2	7.0	32.0	32.0	32.0	29.7	29.7	7.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.3	34.1	34.1	17.2	13.2	7.0	32.0	32.0	32.0	29.7	29.7	7.4
DesignQueue:	1	7	2	39	2	1	3	5	2	11	1	24

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #12 I-680 SR ON / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.814
Loss Time (sec): 6 (Y/R = 4 sec) Average Delay (sec/veh): 4.4
Optimal Cycle: 61 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 0 0 0 0	0 0 0 0 0	0 0 1 0 1	1 0 1 0 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	0	0	0	0	0	39	1102	81	1074	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	39	1102	81	1074	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	39	1102	81	1074	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	41	1160	85	1131	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	41	1160	85	1131	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	0	41	1160	85	1131	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.95	1.00
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
Final Sat.:	0	0	0	0	0	0	0	1900	1615	1805	1900

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.72	0.05	0.60
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.2	88.2	5.8	94.0
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.81	0.81	0.63
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.2	54.6	0.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.2	54.6	0.8
DesignQueue:	0	0	0	0	0	0	0	0	9	5	4

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.377
Loss Time (sec): 6 (Y4R = 4 sec) Average Delay (sec/veh): 4.6
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	2 0 0 0 1	0 0 0 0 0	0 0 1 0 0	0 0 2 0 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	1055	0	93	0	0	0	0	39	0	0	130	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1055	0	93	0	0	0	0	39	0	0	130	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1055	0	93	0	0	0	0	39	0	0	130	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1111	0	98	0	0	0	0	41	0	0	137	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1111	0	98	0	0	0	0	41	0	0	137	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.00
Final Vol:	1144	0	98	0	0	0	0	41	0	0	144	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.00
Final Sat:	3610	0	1615	0	0	0	0	1900	0	0	3800	0

Capacity Analysis Module:

Vol/Sat:	0.32	0.00	0.06	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.00
Crit Moves:	****						****				****	
Green Time:	84.0	0.0	84.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	10.0	0.0
Volume/Cap:	0.38	0.00	0.07	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.38	0.00
Delay/Veh:	1.3	0.0	0.9	0.0	0.0	0.0	0.0	26.8	0.0	0.0	27.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.3	0.0	0.9	0.0	0.0	0.0	0.0	26.8	0.0	0.0	27.5	0.0
DesignQueue:	11	0	1	0	0	0	0	2	0	0	7	0

YEAR 2010 WITH PROJECT CONDITIONS

TURNING MOVEMENTS VOLUME DEVELOPMENT LEVEL OF SERVICE ANALYSIS

The first tables are the 2010 With Project volumes. The added line shows the Tourtelot residential development trips and Business Park trips at each study intersection. The Total line includes the 2010 Base volumes plus the Tourtelot residential development trips and the Business Park trips. The level of service calculation sheets for each study intersection follows.

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Scenario Report

Scenario: 2010 Project AM

Command: 2010 Project AM
Volume: 2010 Base AM
Geometry: Default Geometry
Impact Fee: Default Impact Fee
Trip Generation: Bus. Park AM Peak
Trip Distribution: Default Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Default Configuration

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Trip Generation Report

Forecast for Tourtelot AM Peak

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Business Par	1.00	Retail Use	0.00	0.00	0	0	0	0.0
2	Business Par	1.00	Industrial Use	0.00	0.00	0	0	0	0.0
3	Tourtlot Re	426.00	Single Family	0.19	0.56	81	239	320	8.7
3	Tourtlot Re	43.00	Multi Family D	0.08	0.43	3	18	21	0.6
Zone 3 Subtotal						84	257	341	9.3
TOTAL						84	257	341	9.3

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Trip Generation Report

Forecast for Bus. Park - AM Peak

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Trips
1	Business Park	1.00	Retail Use	317.00	259.00	317	259	576	15.7
	Zone 1 Subtotal					317	259	576	15.7
2	Business Park	1.00	Industrial Use	2193.00	548.00	2193	548	2741	74.9
	Zone 2 Subtotal					2193	548	2741	74.9
TOTAL						2510	807	3317	90.7

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Turning Movement Report

Tourtelot - AM Peak + Bus. Park - AM Peak

Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#1 EAST SECOND / I-780 EB RAMP													
Base	0	312	126	406	404	0	0	0	0	217	0	288	1753
Added	0	235	0	46	114	0	0	0	0	0	0	481	876
Total	0	547	126	452	518	0	0	0	0	217	0	769	2629
#2 EAST SECOND / I-780 WB RAMP													
Base	249	335	0	0	432	304	0	0	0	413	0	406	2139
Added	0	716	0	0	160	205	0	0	0	0	0	15	1096
Total	249	1051	0	0	592	509	0	0	0	413	0	421	3235
#3 EAST SECOND / ROSE													
Base	169	332	0	0	230	105	300	0	358	0	0	0	1494
Added	45	687	0	0	228	166	442	0	116	0	0	0	1704
Total	214	1019	0	0	458	271	742	0	474	0	0	0	3198
#4 EAST SECOND / INDUSTRIAL													
Base	5	319	344	82	264	515	200	3	7	53	9	12	1813
Added	544	585	0	0	258	237	59	134	136	0	535	0	2488
Total	549	904	344	82	522	752	259	137	143	53	544	12	4301
#5 EAST SECOND / LAKE HERMAN													
Base	16	8	242	1	15	3	8	45	29	392	1444	43	2246
Added	302	0	107	0	0	0	0	119	195	361	234	0	1318
Total	318	8	349	1	15	3	8	164	224	753	1678	43	3564
#6 I-680 SB RAMP / LAKE HERMAN													
Base	0	0	0	102	0	553	0	246	57	61	431	0	1450
Added	0	0	0	0	0	439	0	148	78	0	157	0	822
Total	0	0	0	102	0	992	0	394	135	61	588	0	2272
#7 I-680 NB RAMP / LAKE HERMAN													
Base	465	312	237	9	3	14	29	165	126	85	146	0	1611
Added	157	0	0	0	0	0	0	0	148	0	0	0	305
Total	622	312	237	9	3	14	29	165	274	85	146	0	1916
#8 PARK / INDUSTRIAL													
Base	456	246	522	40	195	5	4	25	121	277	95	308	2294
Added	535	275	0	0	78	0	0	0	134	0	0	0	1022
Total	991	521	522	40	273	5	4	25	255	277	95	308	3316
#9 I-680 SB OFF / INDUSTRIAL													
Base	0	0	0	57	0	395	0	587	0	0	285	0	1324
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	57	0	395	0	587	0	0	285	0	1324

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#10 I-680 NB ON / INDUSTRIAL													
Base	0	0	0	0	0	0	20	624	0	0	350	16	1010
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	20	624	0	0	350	16	1010
#11 PARK / BAYSHORE													
Base	78	23	16	633	140	729	18	49	44	243	30	1083	3086
Added	0	60	0	187	24	0	0	0	0	0	0	750	1021
Total	78	83	16	820	164	729	18	49	44	243	30	1833	4107
#12 I-680 SB ON / BAYSHORE													
Base	0	0	0	0	0	0	0	54	549	42	1356	0	2001
Added	0	0	0	0	0	0	0	0	187	0	750	0	937
Total	0	0	0	0	0	0	0	54	736	42	2106	0	2938
#13 I-680 NB OFF / BAYSHORE													
Base	1310	0	548	0	0	0	0	78	0	0	46	0	1982
Added	750	0	0	0	0	0	0	0	0	0	0	0	750
Total	2060	0	548	0	0	0	0	78	0	0	46	0	2732
#54													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	285	359	0	14	424	118	30	64	71	0	255	20	1640
Total	285	359	0	14	424	118	30	64	71	0	255	20	1640

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Link Volume Report
Tourtlot - AM Peak + Bus. Park - AM Peak

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
#1 EAST SECOND / I 780 EB RAMPS													
Base	418	621	1059	810	600	1410	0	0	0	505	532	1037	3506
Added	235	114	349	160	716	876	0	0	0	481	46	527	1752
Total	673	735	1408	970	1316	2286	0	0	0	986	578	1564	5258
#2 EAST SECOND / I 780 WB RAMPS													
Base	584	845	1429	736	741	1477	0	553	553	819	0	819	4278
Added	716	160	876	365	731	1096	0	205	205	15	0	15	2192
Total	1300	1005	2305	1101	1472	2573	0	758	758	834	0	834	6470
#3 EAST SECOND / ROSE													
Base	501	588	1089	335	632	967	658	274	932	0	0	0	2988
Added	732	364	1096	394	1129	1523	578	211	789	0	0	0	3408
Total	1233	952	2185	729	1761	2490	1236	485	1721	0	0	0	6396
#4 EAST SECOND / INDUSTRIAL													
Base	668	324	992	861	531	1392	210	529	739	74	429	503	3626
Added	1129	394	1523	495	644	1139	329	1316	1645	535	134	669	4976
Total	1797	718	2515	1356	1175	2531	539	1845	2384	609	563	1172	8602
#5 EAST SECOND / LAKE HERMAN													
Base	266	436	702	19	59	78	82	1463	1545	1879	288	2167	4492
Added	409	556	965	0	0	0	314	536	850	595	226	821	2636
Total	675	992	1667	19	59	78	396	1999	2395	2474	514	2988	7128
#6 I 680 SB RAMPS / LAKE HERMAN													
Base	0	118	118	655	0	655	303	984	1287	492	348	840	2900
Added	0	78	78	439	0	439	226	596	822	157	148	305	1644
Total	0	196	196	1094	0	1094	529	1580	2109	649	496	1145	4544
#7 I 680 NB RAMPS / LAKE HERMAN													
Base	1034	214	1248	26	361	387	320	625	945	231	411	642	3222
Added	157	148	305	0	0	0	148	157	305	0	0	0	610
Total	1191	362	1553	26	361	387	468	782	1250	231	411	642	3832
#8 PARK / INDUSTRIAL													
Base	1224	593	1817	240	558	798	150	556	706	680	587	1267	4588
Added	810	212	1022	78	275	353	134	535	669	0	0	0	2044
Total	2034	805	2839	318	833	1151	284	1091	1375	680	587	1267	6632
#9 I-680 SB OFF / INDUSTRIAL													
Base	0	0	0	452	0	452	587	680	1267	285	644	929	2648
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	452	0	452	587	680	1267	285	644	929	2648

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
#10 I-680 NB ON / INDUSTRIAL													
Base	0	0	0	0	36	36	644	350	994	366	624	990	2020
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	36	36	644	350	994	366	624	990	2020
#11 PARK / BAYSHORE													
Base	117	427	544	1502	1124	2626	111	837	948	1356	698	2054	6172
Added	60	24	84	211	810	1021	0	0	0	750	187	937	2042
Total	177	451	628	1713	1934	3647	111	837	948	2106	885	2991	8214
#12 I-680 SB ON / BAYSHORE													
Base	0	591	591	0	0	0	603	1356	1959	1398	54	1452	4002
Added	0	187	187	0	0	0	187	750	937	750	0	750	1874
Total	0	778	778	0	0	0	790	2106	2896	2148	54	2202	5876
#13 I-680 NB OFF / BAYSHORE													
Base	1858	0	1858	0	0	0	78	1356	1434	46	626	672	3964
Added	750	0	750	0	0	0	0	750	750	0	0	0	1500
Total	2608	0	2608	0	0	0	78	2106	2184	46	626	672	5464
#54													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	644	495	1139	556	409	965	165	658	823	275	78	353	3280
Total	644	495	1139	556	409	965	165	658	823	275	78	353	3280

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base		Future		Change in
	Del/ LOS Veh	V/ C	Del/ LOS Veh	V/ C	
# 1 EAST SECOND / I-780 EB RAMPS	B	15.0 0.572	E	51.9 1.027	+36.886 D/V
# 2 EAST SECOND / I-780 WB RAMPS	C	17.2 0.668	C	17.3 0.826	+ 0.076 D/V
# 3 EAST SECOND / ROSE	B	13.2 0.367	B	14.9 0.646	+ 1.761 D/V
# 4 EAST SECOND / INDUSTRIAL	B	13.8 0.390	F	114.3 1.243	+100.451 D/V
# 5 EAST SECOND / LAKE HERMAN	A	4.0 0.543	B	10.1 0.694	+ 6.141 D/V
# 6 I-680 SB RAMPS / LAKE HERMAN	C	15.4 0.659	E	48.5 1.068	+33.100 D/V
# 7 I-680 NB RAMPS / LAKE HERMAN	B	14.1 0.542	C	16.4 0.668	+ 2.309 D/V
# 8 PARK / INDUSTRIAL	C	15.8 0.712	E	50.9 1.116	+35.145 D/V
# 9 I-680 SB OFF / INDUSTRIAL	B	13.2 0.640	B	13.2 0.640	+ 0.000 D/V
# 10 I-680 NB ON / INDUSTRIAL	A	1.2 0.380	A	1.2 0.380	+ 0.000 D/V
# 11 PARK / BAYSHORE	B	11.9 0.801	C	24.4 1.043	+12.581 D/V
# 12 I-680 SB ON / BAYSHORE	A	2.5 0.799	F	98.6 1.241	+96.103 D/V
# 13 I-680 NB OFF / BAYSHORE	A	3.0 0.464	A	3.1 0.704	+ 0.137 D/V

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I-780 EB RAMP

Cycle (sec): 90 Critical Vol./Cap. (X): 1.027
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 51.9
Optimal Cycle: 120 Level Of Service: E

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Protected			Protected			Protected			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	20	20	5	30	0	0	0	0	15	0	15	
Lanes:	0	0	2	0	1	1	0	2	0	0	0	0	1

Volume Module:												
Base Vol:	0	312	126	406	404	0	0	0	0	217	0	288
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	312	126	406	404	0	0	0	0	217	0	288
Added Vol:	0	235	0	46	114	0	0	0	0	0	0	481
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	547	126	452	518	0	0	0	0	217	0	769
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	576	133	476	545	0	0	0	0	228	0	809
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	576	133	476	545	0	0	0	0	228	0	809
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.00	1.00	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	605	133	476	573	0	0	0	0	228	0	809

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat:	0	3800	1615	1805	3800	0	0	0	0	1805	0	1615

Capacity Analysis Module:												
Vol/Sat:	0.00	0.16	0.08	0.26	0.15	0.00	0.00	0.00	0.00	0.13	0.00	0.50
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	0.0	20.0	20.0	21.0	41.0	0.0	0.0	0.0	0.0	40.0	0.0	40.0
Volume/Cap:	0.00	0.72	0.37	1.13	0.33	0.00	0.00	0.00	0.00	0.28	0.00	1.13
Delay/Veh:	0.0	23.0	19.5	104.1	10.2	0.0	0.0	0.0	0.0	10.3	0.0	89.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	23.0	19.5	104.1	10.2	0.0	0.0	0.0	0.0	10.3	0.0	89.3
DesignQueue:	0	25	5	20	16	0	0	0	0	7	0	25

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #2 EAST SECOND / I-780 WB RAMP

Cycle (sec): 100 Critical Vol./Cap. (X): 0.826
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 17.3
Optimal Cycle: 75 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	1	1	0	2	0	1	0

Volume Module:	>> Count Date: 19 May 1999 <<											
Base Vol:	249	335	0	0	432	304	0	0	0	413	0	406
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	249	335	0	0	432	304	0	0	0	413	0	406
Added Vol:	0	716	0	0	160	205	0	0	0	0	0	15
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	249	1051	0	0	592	509	0	0	0	413	0	421
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	262	1106	0	0	623	536	0	0	0	435	0	443
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	262	1106	0	0	623	536	0	0	0	435	0	443
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.05	1.00	1.05	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol:	262	1162	0	0	654	536	0	0	0	448	0	443

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	1.00	2.00	0.00	1.00	2.00	1.00	0.00	0.00	0.00	2.00	1.00	1.00
Final Sat:	1805	3800	0	1900	3800	1615	0	0	0	3610	1900	1615

Capacity Analysis Module:												
Vol/Sat:	0.15	0.31	0.00	0.00	0.17	0.33	0.00	0.00	0.00	0.12	0.00	0.27
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	17.6	57.8	0.0	0.0	40.2	40.2	0.0	0.0	0.0	33.2	0.0	33.2
Volume/Cap:	0.83	0.53	0.00	0.00	0.43	0.83	0.00	0.00	0.00	0.37	0.00	0.83
Delay/Veh:	36.8	8.5	0.0	0.0	14.1	23.3	0.0	0.0	0.0	16.5	0.0	26.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.8	8.5	0.0	0.0	14.1	23.3	0.0	0.0	0.0	16.5	0.0	26.9
DesignQueue:	12	30	0	0	23	19	0	0	0	17	0	18

Benicia Business Park EIR
2010 Project Conditions
AM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #3 EAST SECOND / ROSE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.646
Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 14.9
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	2	0	2	0	0	2	0	0	0	1	0	0

Volume Module: >> Count Date: 19 May 1999 <<
Base Vol: 169 332 0 0 230 105 300 0 358 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 169 332 0 0 230 105 300 0 358 0 0 0
Added Vol: 45 687 0 0 228 166 442 0 136 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 214 1019 0 0 458 271 742 0 494 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 214 1019 0 0 458 271 742 0 494 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 214 1019 0 0 458 271 742 0 494 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.03 1.05 1.00 1.00 1.05 1.00 1.03 1.00 1.00 1.00 1.00 1.00
Final Vol.: 220 1070 0 0 481 271 764 0 494 0 0 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 1.00 1.00 0.85 0.95 1.00 0.85 1.00 1.00 1.00
Lanes: 2.00 2.00 0.00 0.00 2.00 1.00 2.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 3610 3800 0 0 3800 1615 3610 0 1615 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.06 0.28 0.00 0.00 0.13 0.17 0.21 0.00 0.31 0.00 0.00 0.00
Crit Moves: ****
Green Time: 23.6 43.6 0.0 0.0 20.0 67.4 47.4 0.0 47.4 0.0 0.0 0.0
Volume/Cap: 0.26 0.65 0.00 0.00 0.63 0.25 0.45 0.00 0.65 0.00 0.00 0.00
Delay/Veh: 20.1 14.9 0.0 0.0 24.9 4.2 11.5 0.0 14.2 0.0 0.0 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 20.1 14.9 0.0 0.0 24.9 4.2 11.5 0.0 14.2 0.0 0.0 0.0
DesignQueue: 9 36 0 0 22 5 24 0 16 0 0 0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #4 EAST SECOND / INDUSTRIAL

Cycle (sec): 120 Critical Vol./Cap. (X): 1.243
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 114.3
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Include			Include		
Min. Green:	5	20	20	5	20	20	18	18	18	18	18	18
Lanes:	1	0	1	0	1	0	1	0	1	0	2	0

Volume Module:
Base Vol: 5 319 344 82 264 515 200 3 7 53 9 12
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 319 344 82 264 515 200 3 7 53 9 12
Added Vol: 544 585 0 0 258 237 59 134 136 0 535 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 549 904 344 82 522 752 259 137 143 53 544 12
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 578 952 362 86 549 792 273 144 151 56 573 13
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 578 952 362 86 549 792 273 144 151 56 573 13
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.03 1.00 1.00
Final Vol.: 578 952 362 86 549 792 273 144 151 57 573 13

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.95 0.92 0.92 0.95 1.00 1.00
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.49 0.51 2.00 0.98 0.02
Final Sat.: 1805 1900 1615 1805 1900 1615 1805 853 895 3610 1858 42

Capacity Analysis Module:
Vol/Sat: 0.32 0.50 0.22 0.05 0.29 0.49 0.15 0.17 0.17 0.02 0.31 0.31
Crit Moves: ****
Green Time: 29.8 56.0 74.0 5.3 31.5 49.5 18.0 28.7 28.7 18.0 28.7 28.7
Volume/Cap: 1.29 1.07 0.36 1.07 1.10 1.19 1.01 0.71 0.71 0.11 1.29 1.29
Delay/Veh: 216.8 66.8 7.4 145.3 93.8 130.3 77.4 30.7 30.7 28.5 217 216.9
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 216.8 66.8 7.4 145.3 93.8 130.3 77.4 30.7 30.7 28.5 217 216.9
DesignQueue: 31 39 10 6 29 35 16 8 8 3 32 1

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #5 EAST SECOND / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.694
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 10.1
Optimal Cycle: 70 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	2	0	1	1

Volume Module:

Base Vol:	16	8	242	1	15	3	8	45	29	392	1444	43
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	8	242	1	15	3	8	45	29	392	1444	43
Added Vol:	302	0	107	0	0	0	0	119	195	361	234	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	318	8	349	1	15	3	8	164	224	753	1678	43
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	335	8	367	1	16	3	8	173	236	793	1766	45
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	335	8	367	1	16	3	8	173	236	793	1766	45
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.05	1.05
Final Vol:	345	8	367	1	16	3	8	181	236	816	1855	48

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.98	0.98	0.95	1.00	0.85	0.95	1.00	1.00
Lanes:	2.00	1.00	1.00	1.00	0.84	0.16	1.00	2.00	1.00	2.00	1.95	0.05
Final Sat:	3610	1900	1615	1805	1568	294	1805	3800	1615	3610	3704	96

Capacity Analysis Module:

Vol/Sat:	0.10	0.00	0.23	0.00	0.01	0.01	0.00	0.05	0.15	0.23	0.50	0.50
Crit Moves:	***			***			***			***		
Green Time:	13.8	13.5	72.9	1.8	1.5	1.5	0.6	13.3	27.1	59.5	72.1	72.1
Volume/Cap:	0.69	0.03	0.11	0.03	0.69	0.69	0.69	0.36	0.54	0.38	0.69	0.69
Delay/Veh:	29.4	24.3	3.1	31.2	65.1	65.1	92.3	25.7	21.2	6.9	5.6	5.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.4	24.3	3.1	31.2	65.1	65.1	92.3	25.7	21.2	6.9	5.6	5.6
DesignQueue:	17	0	6	0	1	0	0	9	10	19	33	1

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #6 I 680 SB RAMPS / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 1.068
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 48.5
Optimal Cycle: 120 Level Of Service: E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	1	0	0	0	1	0	2	0

Volume Module: >> Count Date: 20 May 1999 <<

Base Vol:	0	0	0	102	0	553	0	246	57	61	431	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	102	0	553	0	246	57	61	431	0
Added Vol:	0	0	0	0	0	419	0	148	78	0	157	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	102	0	992	0	394	135	61	588	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	107	0	1044	0	415	142	64	619	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	107	0	1044	0	415	142	64	619	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.00	1.00
Final Vol:	0	0	0	107	0	1044	0	435	142	66	619	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	2.00	1.00	0.00
Final Sat:	0	0	0	1805	0	1615	0	1800	1615	3610	1900	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.06	0.00	0.65	0.00	0.11	0.09	0.02	0.33	0.00
Crit Moves:	***			***			***			***		
Green Time:	0.0	0.0	0.0	60.5	0.0	60.5	0.0	26.3	26.3	4.2	30.5	0.0
Volume/Cap:	0.00	0.00	0.00	0.10	0.00	1.07	0.00	0.44	0.11	0.44	1.07	0.00
Delay/Veh:	0.0	0.0	0.0	5.4	0.0	55.7	0.0	20.0	19.4	11.5	72.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	5.4	0.0	55.7	0.0	20.0	19.4	11.5	72.5	0.0
DesignQueue:	0	0	0	2	0	27	0	18	6	4	26	0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #7 I-680 NB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.668
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 16.4
Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	1	0	0	1	0	0	1	0	0

Volume Module: >> Count Date: 20 May 1999 <<
Base Vol: 465 332 237 9 3 14 29 165 126 85 146 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 465 332 237 9 3 14 29 165 126 85 146 0
Added Vol: 157 0 0 0 0 0 0 0 0 148 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 622 332 237 9 3 14 29 165 274 85 146 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 655 349 249 9 3 15 31 174 288 89 154 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 655 349 249 9 3 15 31 174 288 89 154 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 655 349 249 9 3 15 31 174 288 89 154 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.94 0.94 0.80 0.80 0.80 0.95 1.00 0.85 0.95 1.00 1.00
Lanes: 1.00 0.58 0.42 0.33 0.11 0.56 1.00 1.00 1.00 1.00 1.00 0.00
Final Sat.: 1805 1042 744 509 170 848 1805 1900 1615 1805 1900 0

Capacity Analysis Module:
Vol/Sat: 0.36 0.33 0.33 0.02 0.02 0.02 0.02 0.09 0.18 0.05 0.08 0.00
Crit Moves: ****
Green Time: 54.3 54.1 54.1 2.9 2.6 2.6 6.0 26.7 26.7 7.4 28.1 0.0
Volume/Cap: 0.67 0.62 0.62 0.62 0.67 0.67 0.29 0.34 0.67 0.67 0.29 0.00
Delay/Veh: 11.8 11.1 11.1 46.2 52.8 52.8 29.5 19.3 23.9 37.2 18.3 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 11.8 11.1 11.1 46.2 52.8 52.8 29.5 19.3 23.9 37.2 18.3 0.0
DesignQueue: 18 10 7 0 0 1 2 7 12 5 6 0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #8 PARK / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 1.116
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 50.9
Optimal Cycle: 120 Level Of Service: E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	1	0	0	1	0	0	1	0	0

Volume Module:
Base Vol: 456 246 522 40 195 5 4 25 121 277 95 308
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 456 246 522 40 195 5 4 25 121 277 95 308
Added Vol: 535 275 0 0 78 0 0 0 114 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 991 521 522 40 273 5 4 25 255 277 95 308
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 1043 548 549 42 287 5 4 26 268 292 100 324
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 1043 548 549 42 287 5 4 26 268 292 100 324
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 1043 548 549 42 287 5 4 26 268 300 100 324

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.95 1.00 0.85 0.95 0.89 0.89
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 2.00 0.24 0.76
Final Sat.: 1805 1900 1615 1805 1900 1615 1805 1900 1615 3610 399 1292

Capacity Analysis Module:
Vol/Sat: 0.58 0.29 0.34 0.02 0.15 0.00 0.00 0.01 0.17 0.08 0.25 0.25
Crit Moves: ****
Green Time: 51.8 60.5 79.9 4.9 13.5 13.5 0.2 3.2 55.0 19.5 22.5 22.5
Volume/Cap: 1.12 0.48 0.43 0.48 1.12 0.02 1.12 0.43 0.30 0.43 1.12 1.12
Delay/Veh: 79.3 7.3 2.1 33.0 115 24.2 538.4 33.5 7.9 23.1 103 102.9
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 79.3 7.3 2.1 33.0 115 24.2 538.4 33.5 7.9 23.1 103 102.9
DesignQueue: 33 13 7 2 14 0 0 1 7 14 5 15

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Level of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-680 SB OFF / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.640
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 13.2
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	0	1	0	0	1	0	0

Volume Module: >> Count Date: 20 May 1999 <<

Base Vol:	0	0	0	57	0	395	0	587	0	0	285	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	57	0	395	0	587	0	0	285	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	57	0	395	0	587	0	0	285	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	60	0	416	0	618	0	0	300	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	60	0	416	0	618	0	0	300	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	60	0	416	0	618	0	0	300	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Final Sat:	0	0	0	1805	0	1615	0	1900	0	0	1900	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.03	0.00	0.26	0.00	0.33	0.00	0.00	0.16	0.00
Crit Moves:	****											
Green Time:	0.0	0.0	0.0	40.2	0.0	40.2	0.0	50.8	0.0	0.0	50.8	0.0
Volume/Cap:	0.00	0.00	0.00	0.08	0.00	0.64	0.00	0.64	0.00	0.00	0.31	0.00
Delay/Veh:	0.0	0.0	0.0	11.9	0.0	17.1	0.0	12.6	0.0	0.0	9.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	11.9	0.0	17.1	0.0	12.6	0.0	0.0	9.4	0.0
DesignQueue:	0	0	0	2	0	15	0	18	0	0	9	0

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1994 HCM Operations Method (Future Volume Alternative)

Intersection #10 I-680 NB ON / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.380
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 1.2
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	1	0	1	0	0	1

Volume Module:

Base Vol:	0	0	0	0	0	0	20	624	0	0	350	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	20	624	0	0	350	16
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	20	624	0	0	350	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	21	657	0	0	368	17
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	21	657	0	0	368	17
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	0	0	0	21	657	0	0	368	17

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.85
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Final Sat:	0	0	0	0	0	0	1805	1900	0	0	1900	1615

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.35	0.00	0.00	0.19	0.01
Crit Moves:	****											
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	5.2	91.0	0.0	0.0	85.8	85.8
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.38	0.00	0.00	0.23	0.01
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	29.6	0.5	0.0	0.0	0.8	0.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	29.6	0.5	0.0	0.0	0.8	0.7
DesignQueue:	0	0	0	0	0	0	1	4	0	0	3	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #11 PARK / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 1.043
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 24.4
Optimal Cycle: 120 Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Ovl	Include	Ovl
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 0 1 0	2 0 1 0 1	0 0 1 0 0	0 1 0 0 2

Volume Module:

Base Vol:	78	23	16	633	140	729	18	49	44	243	30	1083
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	23	16	633	140	729	18	49	44	243	30	1083
Added Vol:	0	60	0	187	24	0	0	0	0	0	0	750
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	83	16	820	164	729	18	49	44	243	30	1833
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	82	87	17	863	173	767	19	52	46	256	32	1929
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	87	17	863	173	767	19	52	46	256	32	1929
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.13
Final Vol:	82	87	17	889	173	767	19	52	46	256	32	2180

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.98	0.98	0.95	1.00	0.85	0.84	0.84	0.84	0.96	0.96	0.85
Lanes:	1.00	0.84	0.16	2.00	1.00	1.00	0.16	0.45	0.39	0.89	0.11	2.00
Final Sat:	1805	1558	304	3610	1900	1615	260	711	629	1621	203	3230

Capacity Analysis Module:

Vol/Sat:	0.05	0.06	0.06	0.25	0.09	0.47	0.07	0.07	0.07	0.16	0.16	0.67
Crit Moves:	****			****		****				****		****
Green Time:	4.4	7.9	7.9	35.0	38.5	45.5	7.0	7.0	7.0	41.1	41.1	76.1
Volume/Cap:	1.04	0.70	0.70	0.70	0.24	1.04	1.04	1.04	1.04	0.38	0.38	0.89
Delay/Veh:	126.0	38.4	38.4	19.4	13.5	55.1	111.1	111.1	111.1	13.5	13.5	8.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	126.0	38.4	38.4	19.4	13.5	55.1	111.1	111.1	111.1	13.5	13.5	8.9
DesignQueue:	4	5	1	34	6	26	1	3	2	9	1	34

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #12 I-680 SB ON / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 1.241
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 98.6
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 0 0 0 0	0 0 0 0 0	0 0 1 0 1	1 0 1 0 0

Volume Module:

Base Vol:	0	0	0	0	0	54	549	42	1356	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	54	549	42	1356
Added Vol:	0	0	0	0	0	0	0	187	0	750
PasserByVol:	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	54	736	42	2106
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	57	775	44	2217
Reduct Vol:	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	57	775	44	2217
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	0	0	0	57	775	44	2217

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.95	1.00
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Final Sat:	0	0	0	0	0	0	0	1900	1615	1805

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.48	0.02
Crit Moves:	****			****		****		****		****
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	89.5	89.5	4.5
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.54	0.54
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	35.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	35.2
DesignQueue:	0	0	0	0	0	0	0	0	5	2

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.704
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 3.1
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	1	0	0	0	0	0	1	0	0

Volume Module:												
Base Vol:	1310	0	548	0	0	0	0	78	0	0	46	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1310	0	548	0	0	0	0	78	0	0	46	0
Added Vol:	750	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2060	0	548	0	0	0	0	78	0	0	46	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	2168	0	577	0	0	0	0	82	0	0	48	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2168	0	577	0	0	0	0	82	0	0	48	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00
Final Vol.:	2233	0	577	0	0	0	0	82	0	0	51	0

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.00
Final Sat.:	3610	0	1615	0	0	0	0	1900	0	0	3800	0

Capacity Analysis Module:												
Vol/Sat:	0.62	0.00	0.36	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00
Crit Moves:	****							****				
Green Time:	87.9	0.0	87.9	0.0	0.0	0.0	0.0	6.1	0.0	0.0	6.1	0.0
Volume/Cap:	0.70	0.00	0.41	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.22	0.00
Delay/Veh:	1.8	0.0	0.8	0.0	0.0	0.0	0.0	41.2	0.0	0.0	28.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.8	0.0	0.8	0.0	0.0	0.0	0.0	41.2	0.0	0.0	28.9	0.0
DesignQueue:	18	0	4	0	0	0	0	4	0	0	3	0

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Scenario Report

Scenario: 2010 Project PM

Command: 2010 Project PM
Volume: 2010 Base PM
Geometry: Default Geometry
Impact Fee: Default Impact Fee
Trip Generation: Bus. Park PM Peak
Trip Distribution: Default Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Default Configuration

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Trip Generation Report

Forecast for Tourtelot PM Peak

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
3	Tourtelot Re	426.00	Single Family	0.65	0.36	277	153	430	8.4
3	Tourtelot Re	43.00	Multi Family D	0.41	0.21	18	9	27	0.5
Zone 3 Subtotal						295	162	457	8.9
TOTAL						295	162	457	8.9

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Trip Generation Report

Forecast for Bus. Park PM Peak

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Business Par	1.00	Retail Use	836.00	836.00	836	836	1672	32.7
	Zone 1 Subtotal					836	836	1672	32.7
2	Business Par	1.00	Industrial Use	598.00	2391.00	598	2391	2989	58.4
	Zone 2 Subtotal					598	2391	2989	58.4
TOTAL						1434	3227	4661	91.1

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Turning Movement Report
Tourtelot - PM Peak + Bus. Park PM Peak

Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#1 EAST SECOND / I 780 EB RAMP													
Base	0	531	141	192	722	0	0	0	0	172	0	162	1920
Added	0	214	0	29	343	0	0	0	0	0	0	293	879
Total	0	745	141	221	1065	0	0	0	0	172	0	455	2799
#2 EAST SECOND / I 780 WB RAMP													
Base	332	395	0	0	489	335	0	0	0	666	0	148	2565
Added	0	507	0	0	372	625	0	0	0	0	0	53	1557
Total	332	902	0	0	861	960	0	0	0	666	0	401	4122
#3 EAST SECOND / ROSE													
Base	454	291	0	0	312	379	113	0	134	0	0	0	1683
Added	156	404	0	0	911	630	352	0	86	0	0	0	2539
Total	610	695	0	0	1223	1009	465	0	220	0	0	0	4222
#4 EAST SECOND / INDUSTRIAL													
Base	34	362	94	3	212	248	111	17	88	600	14	28	1811
Added	148	607	0	0	948	65	258	583	593	0	146	0	3348
Total	182	969	94	3	1160	313	369	600	681	600	160	28	5159
#5 EAST SECOND / LAKE HERMAN													
Base	117	87	536	20	20	12	20	19	16	275	493	140	1755
Added	561	0	399	0	0	0	0	412	663	118	334	0	2487
Total	678	87	935	20	20	12	20	431	679	393	827	140	4242
#6 I-680 SB RAMP / LAKE HERMAN													
Base	0	0	0	33	0	223	0	473	129	120	643	0	1621
Added	0	0	0	0	0	229	0	542	268	0	223	0	1262
Total	0	0	0	33	0	452	0	1015	397	120	866	0	2883
#7 I-680 NB RAMP / LAKE HERMAN													
Base	505	15	78	2	3	60	27	70	434	258	249	0	1701
Added	223	0	0	0	0	0	0	0	542	0	0	0	765
Total	728	15	78	2	3	60	27	70	976	258	249	0	2466
#8 PARK / INDUSTRIAL													
Base	478	181	464	58	421	22	36	98	135	547	98	203	2741
Added	146	112	0	0	324	0	0	0	583	0	0	0	1165
Total	624	293	464	58	745	22	36	98	718	547	98	203	3906
#9 I-680 SB OFF / INDUSTRIAL													
Base	0	0	0	11	0	86	0	685	0	0	669	0	1451
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	11	0	86	0	685	0	0	669	0	1451

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#10 I-680 NB ON / INDUSTRIAL													
Base	0	0	0	0	0	0	209	473	0	0	660	66	1408
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	209	473	0	0	660	66	1408
#11 PARK / BAYSHORE													
Base	26	132	39	1012	57	45	50	98	44	226	20	854	2603
Added	0	54	0	817	90	0	0	0	0	0	0	204	1165
Total	26	186	39	1829	147	45	50	98	44	226	20	1058	3768
#12 I-680 SB ON / BAYSHORE													
Base	0	0	0	0	0	0	0	39	1102	81	1074	0	2296
Added	0	0	0	0	0	0	0	0	817	0	204	0	1021
Total	0	0	0	0	0	0	0	39	1919	81	1278	0	3317
#13 I-680 NB OFF / BAYSHORE													
Base	1055	0	93	0	0	0	0	39	0	0	130	0	1317
Added	204	0	0	0	0	0	0	0	0	0	0	0	204
Total	1259	0	93	0	0	0	0	39	0	0	130	0	1521
#54													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	78	788	0	47	702	32	129	278	311	0	69	43	2477
Total	78	788	0	47	702	32	129	278	311	0	69	43	2477

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Link Volume Report
Tourtlot - PM Peak + Bus. Park - PM Peak

Volume	NB Link			SB Link			EB Link			WB Link			Total
Type	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	Volume
#1 EAST SECOND / I-780 EB RAMP													
Base	672	894	1566	914	693	1607	0	0	0	334	333	667	3840
Added	214	343	557	372	507	879	0	0	0	293	29	322	1758
Total	886	1237	2123	1286	1200	2486	0	0	0	627	362	989	5598
#2 EAST SECOND / I-780 WB RAMP													
Base	727	1155	1882	824	743	1567	0	667	667	1014	0	1014	5130
Added	507	372	879	997	560	1557	0	625	625	53	0	53	3114
Total	1234	1527	2761	1821	1303	3124	0	1292	1292	1067	0	1067	8244
#3 EAST SECOND / ROSE													
Base	745	446	1191	691	404	1095	247	833	1080	0	0	0	3366
Added	560	997	1557	1541	756	2297	438	786	1224	0	0	0	5078
Total	1305	1443	2748	2232	1160	3392	685	1619	2304	0	0	0	8444
#4 EAST SECOND / INDUSTRIAL													
Base	490	900	1390	463	501	964	216	296	512	642	114	756	3622
Added	755	1541	2296	1013	865	1878	1434	359	1793	146	583	729	6696
Total	1245	2441	3686	1476	1366	2842	1650	655	2305	788	697	1485	10318
#5 EAST SECOND / LAKE HERMAN													
Base	740	311	1051	52	247	299	55	622	677	908	575	1483	3510
Added	960	781	1741	0	0	0	1075	895	1970	452	811	1263	4974
Total	1700	1092	2792	52	247	299	1130	1517	2647	1360	1386	2746	8484
#6 I-680 SB RAMP / LAKE HERMAN													
Base	0	249	249	256	0	256	602	866	1468	763	506	1269	3242
Added	0	268	268	229	0	229	810	452	1262	223	542	765	2524
Total	0	517	517	485	0	485	1412	1318	2730	986	1048	2034	5766
#7 I-680 NB RAMP / LAKE HERMAN													
Base	598	695	1293	65	42	107	531	814	1345	507	150	657	3402
Added	223	542	765	0	0	0	542	223	765	0	0	0	1530
Total	821	1237	2058	65	42	107	1073	1037	2110	507	150	657	4932
#8 PARK / INDUSTRIAL													
Base	1123	1103	2226	501	420	921	269	598	867	848	620	1468	5482
Added	258	907	1165	324	112	436	583	146	729	0	0	0	2330
Total	1381	2010	3391	825	532	1357	852	744	1596	848	620	1468	7812
#9 I-680 SB OFF / INDUSTRIAL													
Base	0	0	0	97	0	97	685	755	1440	669	696	1365	2902
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	97	0	97	685	755	1440	669	696	1365	2902

Benicia Business Park EIR
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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
#10 I-680 NB ON / INDUSTRIAL													
Base	0	0	0	0	275	275	682	660	1342	726	473	1199	2816
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	275	275	682	660	1342	726	473	1199	2816
#11 PARK / BAYSHORE													
Base	197	327	524	1114	1036	2150	192	91	283	1100	1149	2249	5206
Added	54	90	144	907	258	1165	0	0	0	204	817	1021	2330
Total	251	417	668	2021	1294	3315	192	91	283	1304	1966	3270	7536
#12 I-680 SB ON / BAYSHORE													
Base	0	1183	1183	0	0	0	1141	1074	2215	1155	39	1194	4592
Added	0	817	817	0	0	0	817	204	1021	204	0	204	2042
Total	0	2000	2000	0	0	0	1958	1278	3236	1359	39	1398	6634
#13 I-680 NB OFF / BAYSHORE													
Base	1148	0	1148	0	0	0	39	1185	1224	130	132	262	2634
Added	204	0	204	0	0	0	0	204	204	0	0	0	408
Total	1352	0	1352	0	0	0	39	1389	1428	130	132	262	3042
#54													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	866	1013	1879	781	960	1741	718	179	897	112	325	437	4954
Total	866	1013	1879	781	960	1741	718	179	897	112	325	437	4954

Benicia Business Park EIR
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Impact Analysis Report
Level Of Service

Intersection		Base Del/V/ LOS Veh C		Future Del/V/ LOS Veh C		Change in
# 1	EAST SECOND / I-780 EB RAMPS	B	11.2 0.407	C	15.9 0.714	+ 4.736 D/V
# 2	EAST SECOND / I-780 WB RAMPS	C	18.4 0.702	F	61.2 1.188	+42.824 D/V
# 3	EAST SECOND / ROSE	B	13.1 0.328	C	16.2 0.882	+ 3.107 D/V
# 4	EAST SECOND / INDUSTRIAL	C	19.1 0.500	F	906.3 1.890	+887.212 D/V
# 5	EAST SECOND / LAKE HERMAN	B	12.4 0.545	C	23.2 0.977	+10.723 D/V
# 6	I-680 SB RAMPS / LAKE HERMAN	B	11.1 0.551	C	16.5 0.851	+ 5.335 D/V
# 7	I-680 NB RAMPS / LAKE HERMAN	D	27.7 0.852	F	244.1 1.382	+216.448 D/V
# 8	PARK / INDUSTRIAL	C	24.0 0.830	F	95.8 1.188	+71.835 D/V
# 9	I-680 SB OFF / INDUSTRIAL	A	4.1 0.479	A	4.1 0.479	+ 0.000 D/V
# 10	I-680 NB ON / INDUSTRIAL	B	6.3 0.536	B	6.3 0.536	+ 0.000 D/V
# 11	PARK / BAYSHORE	C	16.8 0.733	D	36.0 1.037	+19.257 D/V
# 12	I-680 SB ON / BAYSHORE	A	4.3 0.814	F	160.9 1.381	+156.580 D/V
# 13	I-680 NB OFF / BAYSHORE	A	4.6 0.377	A	4.2 0.443	0.397 D/V

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I-780 EB RAMP

Cycle (sec): 90 Critical Vol./Cap. (X): 0.714
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 15.9
Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	20	20	5	30	0	0	0	0	15	0	15
Lanes:	0	0	2	0	1	1	0	2	0	0	0	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	531	141	192	722	0	0	0	0	172	0	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	531	141	192	722	0	0	0	0	172	0	162
Added Vol:	0	214	0	29	343	0	0	0	0	0	0	293
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	745	141	221	1065	0	0	0	0	172	0	455
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	784	148	233	1121	0	0	0	0	181	0	479
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	784	148	233	1121	0	0	0	0	181	0	479
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.00	1.00	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	823	148	233	1177	0	0	0	0	181	0	479

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85	0.85
Lanes:	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
Final Sat:	0	3800	1615	1805	3800	0	0	0	0	1805	0	1615

Capacity Analysis Module:

Vol/Sat:	0.00	0.22	0.09	0.13	0.31	0.00	0.00	0.00	0.00	0.10	0.00	0.30
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	0.0	27.3	27.3	16.3	43.6	0.0	0.0	0.0	0.0	37.4	0.0	37.4
Volume/Cap:	0.00	0.71	0.30	0.71	0.64	0.00	0.00	0.00	0.00	0.24	0.00	0.71
Delay/Veh:	0.0	19.5	15.6	27.3	11.7	0.0	0.0	0.0	0.0	11.1	0.0	16.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	19.5	15.6	27.3	11.7	0.0	0.0	0.0	0.0	11.1	0.0	16.6
DesignQueue:	0	30	5	10	33	0	0	0	0	5	0	15

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #2 EAST SECOND / I-780 WB RAMP

Cycle (sec): 100 Critical Vol./Cap. (X): 1.188
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 61.2
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	1	1	0	2	0	1	0

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM

Base Vol:	332	395	0	0	489	335	0	0	0	666	0	348
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	332	395	0	0	489	335	0	0	0	666	0	348
Added Vol:	0	507	0	0	372	625	0	0	0	0	0	53
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	332	902	0	0	861	960	0	0	0	666	0	401
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	349	949	0	0	906	1011	0	0	0	701	0	422
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	349	949	0	0	906	1011	0	0	0	701	0	422
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.05	1.00	1.05	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol:	349	997	0	0	952	1011	0	0	0	722	0	422

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	1.00	2.00	0.00	1.00	2.00	1.00	0.00	0.00	0.00	2.00	1.00	1.00
Final Sat:	1805	3800	0	1900	3800	1615	0	0	0	1610	1900	1615

Capacity Analysis Module:

Vol/Sat:	0.19	0.26	0.00	0.00	0.25	0.63	0.00	0.00	0.00	0.20	0.00	0.26
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	16.3	69.0	0.0	0.0	52.7	52.7	0.0	0.0	0.0	22.0	0.0	22.0
Volume/Cap:	1.19	0.38	0.00	0.00	0.48	1.19	0.00	0.00	0.00	0.91	0.00	1.19
Delay/Veh:	149.9	4.3	0.0	0.0	9.8	119.5	0.0	0.0	0.0	34.9	0.0	143.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	149.9	4.3	0.0	0.0	9.8	119.5	0.0	0.0	0.0	34.9	0.0	143.6
DesignQueue:	17	18	0	0	27	31	0	0	0	33	0	19

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #3 EAST SECOND / ROSE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.882
Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 94 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	2	0	2	0	0	2	0	0	1	2	0	0

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM

Base Vol:	454	291	0	0	312	379	113	0	134	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	454	291	0	0	312	379	113	0	134	0	0	0
Added Vol:	156	404	0	0	911	630	352	0	86	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	610	695	0	0	1223	1009	465	0	220	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	610	695	0	0	1223	1009	465	0	220	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	610	695	0	0	1223	1009	465	0	220	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.05	1.00	1.00	1.05	1.00	1.03	1.00	1.00	1.00	1.00	1.00
Final Vol:	628	730	0	0	1284	1009	479	0	220	0	0	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	0.95	1.00	0.85	1.00	1.00	1.00
Lanes:	2.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat:	3610	3800	0	0	3800	1615	3610	0	1615	0	0	0

Capacity Analysis Module:

Vol/Sat:	0.17	0.19	0.00	0.00	0.34	0.62	0.13	0.00	0.14	0.00	0.00	0.00
Crit Moves:	****					****			****			
Green Time:	20.7	70.0	0.0	0.0	49.3	70.3	21.0	0.0	21.0	0.0	0.0	0.0
Volume/Cap:	0.84	0.27	0.00	0.00	0.69	0.89	0.63	0.00	0.65	0.00	0.00	0.00
Delay/Veh:	30.6	3.6	0.0	0.0	13.3	13.9	24.5	0.0	26.3	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.6	3.6	0.0	0.0	13.3	13.9	24.5	0.0	26.3	0.0	0.0	0.0
DesignQueue:	29	13	0	0	40	19	22	0	10	0	0	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #4 EAST SECOND / INDUSTRIAL

Cycle (sec): 120 Critical Vol./Cap. (X): 1.890
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 906.3
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Include			Include		
Min. Green:	5	20	20	5	20	20	18	18	18	18	18	18
Lanes:	1	0	1	0	1	1	1	0	1	0	2	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	34	362	94	3	212	248	111	17	88	600	14	28
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	362	94	3	212	248	111	17	88	600	14	28
Added Vol:	148	607	0	0	948	65	258	583	593	0	146	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	182	969	94	3	1160	313	369	600	681	600	160	28
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	192	1020	99	3	1221	329	388	632	717	632	168	29
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	192	1020	99	3	1221	329	388	632	717	632	168	29
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol:	192	1020	99	3	1221	329	388	632	717	651	168	29

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.92	0.92	0.95	0.98	0.98
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.47	0.53	2.00	0.85	0.15
Final Sat:	1805	1900	1615	1805	1900	1615	1805	819	929	3610	1588	274

Capacity Analysis Module:

Vol/Sat:	0.11	0.54	0.06	0.00	0.64	0.20	0.21	0.77	0.77	0.18	0.11	0.11
Crit Moves:	****			****			****			****		
Green Time:	6.3	39.3	57.3	5.0	38.0	83.7	45.7	45.7	45.7	18.0	18.0	18.0
Volume/Cap:	2.03	1.64	0.13	0.04	2.03	0.29	0.56	2.03	2.03	1.20	0.71	0.71
Delay/Veh:	1609	633	11.3	35.7	1507	4.5	19.8	1503	1503	152.6	36.7	36.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1609	633	11.3	35.7	1507	4.5	19.8	1503	1503	152.6	36.7	36.7
DesignQueue:	12	53	3	0	67	7	17	32	36	39	10	2

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #5 EAST SECOND / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.977
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 23.2
Optimal Cycle: 120 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	2	0	1	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	117	87	536	20	20	12	20	19	16	275	493	140
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	117	87	536	20	20	12	20	19	16	275	493	140
Added Vol:	561	0	399	0	0	0	0	412	663	118	334	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	678	87	935	20	20	12	20	431	679	393	827	140
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	714	92	984	21	21	13	21	454	715	414	871	147
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	714	92	984	21	21	13	21	454	715	414	871	147
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.05	1.05
Final Vol.:	735	92	984	21	21	13	21	476	715	426	914	155

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.94	0.94	0.95	1.00	0.85	0.95	0.98	0.98
Lanes:	2.00	1.00	1.00	1.00	0.62	0.38	1.00	2.00	1.00	2.00	1.71	0.29
Final Sat.:	3610	1900	1615	1805	1103	683	1805	3800	1615	3610	3184	540

Capacity Analysis Module:

Vol/Sat:	0.20	0.05	0.61	0.01	0.02	0.02	0.01	0.13	0.44	0.12	0.29	0.29
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	47.1	50.3	62.3	1.2	4.4	4.4	1.4	24.5	71.5	12.1	35.1	35.1
Volume/Cap:	0.43	0.10	0.98	0.98	0.43	0.43	0.82	0.51	0.62	0.98	0.82	0.82
Delay/Veh:	11.5	8.4	28.9	169.2	32.5	32.5	95.8	21.5	5.4	56.1	22.0	22.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.5	8.4	28.9	169.2	32.5	32.5	95.8	21.5	5.4	56.1	22.0	22.0
DesignQueue:	23	3	24	1	1	1	1	21	13	21	36	6

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #6 I-680 SB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.851
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 16.5
Optimal Cycle: 83 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	1	0	0	1	0	0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	0	0	0	33	0	223	0	473	129	120	643	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	33	0	223	0	473	129	120	643	0
Added Vol:	0	0	0	0	0	229	0	542	268	0	223	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	33	0	452	0	1015	397	120	866	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	35	0	476	0	1068	418	126	912	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	35	0	476	0	1068	418	126	912	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.00	1.00
Final Vol.:	0	0	0	35	0	476	0	1122	418	130	912	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	2.00	1.00	0.00
Final Sat.:	0	0	0	1805	0	1615	0	3800	1615	3610	1900	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.02	0.00	0.29	0.00	0.30	0.26	0.04	0.48	0.00
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	0.0	0.0	0.0	34.6	0.0	34.6	0.0	50.3	50.3	6.1	56.4	0.0
Volume/Cap:	0.00	0.00	0.00	0.06	0.00	0.85	0.00	0.59	0.52	0.59	0.85	0.00
Delay/Veh:	0.0	0.0	0.0	14.1	0.0	28.0	0.0	11.7	11.3	32.4	16.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	14.1	0.0	28.0	0.0	11.7	11.3	32.4	16.6	0.0
DesignQueue:	0	0	0	1	0	19	0	34	12	7	25	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #7 I-680 NB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 1.382
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 244.1
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
Lanes:	1 0 0 1 0	0 0 1 0 0	1 0 1 0 1	1 0 0 1 0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	505	15	78	2	3	60	27	70	434	258	249	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	505	15	78	2	3	60	27	70	434	258	249	0
Added Vol:	223	0	0	0	0	0	0	0	542	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	728	15	78	2	3	60	27	70	976	258	249	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	766	16	82	2	3	63	28	74	1027	272	262	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	766	16	82	2	3	63	28	74	1027	272	262	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	766	16	82	2	3	63	28	74	1027	272	262	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.77	0.77	0.77	0.95	1.00	0.85	0.95	1.00	1.00
Lanes:	1.00	0.16	0.84	0.03	0.04	0.93	1.00	1.00	1.00	1.00	1.00	0.00
Final Sat:	1805	270	1383	43	65	1355	1805	1900	1615	1805	1900	0

Capacity Analysis Module:

Vol/Sat:	0.42	0.06	0.06	0.05	0.05	0.05	0.02	0.04	0.64	0.15	0.14	0.00
Crit Moves:	****			****			****		****			
Green Time:	30.7	19.1	19.1	15.0	3.4	3.4	5.8	46.0	46.0	10.9	51.2	0.0
Volume/Cap:	1.38	0.31	0.31	0.31	1.38	1.38	0.27	0.08	1.38	1.38	0.27	0.00
Delay/Veh:	290.9	22.7	22.7	24.8	412	412.2	29.5	9.8	282.0	322.7	9.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	290.9	22.7	22.7	24.8	412	412.2	29.5	9.8	282.0	322.7	9.0	0.0
DesignQueue:	33	1	4	0	0	3	1	2	36	14	7	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #8 PARK / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 1.188
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 95.8
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Ovl	Include	Ovl	Include
Min. Green:	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
Lanes:	1 0 1 0 1	1 0 1 0 1	1 0 1 0 1	2 0 0 1 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	478	181	464	58	421	22	36	98	135	547	98	203
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	478	181	464	58	421	22	36	98	135	547	98	203
Added Vol:	146	112	0	0	324	0	0	0	583	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	624	293	464	58	745	22	36	98	718	547	98	203
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	657	308	488	61	784	23	38	103	756	576	103	214
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	657	308	488	61	784	23	38	103	756	576	103	214
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol:	657	308	488	61	784	23	38	103	756	593	103	214

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	0.32	0.68
Final Sat:	1805	1900	1615	1805	1900	1615	1805	1900	1615	3610	556	1154

Capacity Analysis Module:

Vol/Sat:	0.36	0.16	0.30	0.03	0.41	0.01	0.02	0.05	0.47	0.16	0.19	0.19
Crit Moves:	****			****			****		****			
Green Time:	30.7	54.1	67.9	11.3	34.7	34.7	2.3	8.8	39.4	13.8	20.3	20.3
Volume/Cap:	1.19	0.30	0.44	0.30	1.19	0.04	0.91	0.62	1.19	1.19	0.91	0.91
Delay/Veh:	132.5	8.2	5.0	26.6	129	14.0	105.4	33.1	127.5	139.6	44.8	44.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	132.5	8.2	5.0	26.6	129	14.0	105.4	33.1	127.5	139.6	44.8	44.8
DesignQueue:	28	8	9	3	32	1	2	5	28	30	5	10

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-680 SB OFF / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.479
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 4.1
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	0	0	0	11	0	86	0	685	0	0	669	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	11	0	86	0	685	0	0	669	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	11	0	86	0	685	0	0	669	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	12	0	91	0	721	0	0	704	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	12	0	91	0	721	0	0	704	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	12	0	91	0	721	0	0	704	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Final Sat:	0	0	0	1805	0	1615	0	1900	0	0	1900	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.06	0.00	0.38	0.00	0.00	0.37	0.00
Crit Moves:	****											
Green Time:	0.0	0.0	0.0	11.8	0.0	11.8	0.0	79.2	0.0	0.0	79.2	0.0
Volume/Cap:	0.00	0.00	0.00	0.06	0.00	0.48	0.00	0.48	0.00	0.00	0.47	0.00
Delay/Veh:	0.0	0.0	0.0	25.3	0.0	28.1	0.0	2.4	0.0	0.0	2.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	25.3	0.0	28.1	0.0	2.4	0.0	0.0	2.4	0.0
DesignQueue:	0	0	0	1	0	5	0	9	0	0	9	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #10 I-680 NB ON / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.536
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 6.3
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	0	0	0	0	0	209	473	0	0	660	66
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	209	473	0	0	660	66
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	209	473	0	0	660	66
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	220	498	0	0	695	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	220	498	0	0	695	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	0	0	0	220	498	0	0	695	69

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.85
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Final Sat:	0	0	0	0	0	0	1805	1900	0	0	1900	1615

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.26	0.00	0.00	0.37	0.04
Crit Moves:	****											
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	22.7	91.0	0.0	0.0	68.3	68.3
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.29	0.00	0.00	0.54	0.06
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	23.0	0.4	0.0	0.0	5.5	3.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	23.0	0.4	0.0	0.0	5.5	3.4
DesignQueue:	0	0	0	0	0	0	10	3	0	0	14	1

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #11 PARK / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 1.037
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 36.0
Optimal Cycle: 120 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ovl			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	1	0	0	2	0	1	0	0	2

Volume Module: 4:00 - 6:00 PM

Base Vol:	26	132	39	1012	57	45	50	98	44	226	20	854
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	132	39	1012	57	45	50	98	44	226	20	854
Added Vol:	0	54	0	817	90	0	0	0	0	0	0	204
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	26	186	39	1829	147	45	50	98	44	226	20	1058
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	27	196	41	1925	155	47	53	103	46	238	21	1114
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	196	41	1925	155	47	53	103	46	238	21	1114
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.13
Final Vol:	27	196	41	1983	155	47	53	103	46	238	21	1258

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.97	0.97	0.95	1.00	0.85	0.86	0.86	0.86	0.96	0.96	0.85
Lanes:	1.00	0.83	0.17	2.00	1.00	1.00	0.26	0.51	0.23	0.92	0.08	2.00
Final Sat:	1805	1524	319	3610	1900	1615	429	834	373	1676	148	3230

Capacity Analysis Module:

Vol/Sat:	0.01	0.13	0.13	0.55	0.08	0.03	0.12	0.12	0.12	0.14	0.14	0.39
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	10.1	12.4	12.4	53.0	55.3	67.2	11.9	11.9	11.9	13.7	13.7	66.7
Volume/Cap:	0.15	1.04	1.04	1.04	0.15	0.04	1.04	1.04	1.04	1.04	1.04	0.58
Delay/Veh:	26.5	85.6	85.6	40.6	7.0	3.6	89.9	89.9	89.9	83.1	83.1	6.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.5	85.6	85.6	40.6	7.0	3.6	89.9	89.9	89.9	83.1	83.1	6.2
DesignQueue:	1	10	2	60	4	1	3	5	2	12	1	26

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #12 I-680 SB ON / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 1.381
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 160.9
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	1	0	1

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	0	0	0	0	0	0	39	1102	81	1074	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	39	1102	81	1074	0
Added Vol:	0	0	0	0	0	0	0	0	817	0	204	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	0	39	1919	81	1278	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	0	41	2020	85	1345	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	0	41	2020	85	1345	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	0	0	0	0	0	0	41	2020	85	1345	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.95	1.00
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
Final Sat:	0	0	0	0	0	0	0	0	1900	1615	1805	1900

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	1.25	0.05	0.71
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.6	90.6	3.4	94.0
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	1.38	1.38	0.75
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	260.5	390.8	1.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	260.5	390.8	1.7
DesignQueue:	0	0	0	0	0	0	0	0	0	15	5	6

Benicia Business Park EIR
2010 Project Conditions
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.443
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 4.2
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	T	R		L	T	R		L	T	R		L	T	R	
Control:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Lanes:	2	0	0	1	0	0	0	0	0	0	1	0	0	0	2	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	1055	0	93	0	0	0	0	39	0	0	130	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1055	0	93	0	0	0	0	39	0	0	130	0
Added Vol:	204	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1259	0	93	0	0	0	0	39	0	0	130	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1325	0	98	0	0	0	0	41	0	0	137	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1325	0	98	0	0	0	0	41	0	0	137	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00
Final Vol.:	1365	0	98	0	0	0	0	41	0	0	144	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.00
Final Sat.:	3610	0	1615	0	0	0	0	1900	0	0	3800	0

Capacity Analysis Module:

Vol/Sat:	0.38	0.00	0.06	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.00
Crit Moves:	****							****				
Green Time:	85.4	0.0	85.4	0.0	0.0	0.0	0.0	8.6	0.0	0.0	8.6	0.0
Volume/Cap:	0.44	0.00	0.07	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.44	0.00
Delay/Veh:	1.2	0.0	0.7	0.0	0.0	0.0	0.0	27.8	0.0	0.0	28.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.2	0.0	0.7	0.0	0.0	0.0	0.0	27.8	0.0	0.0	28.7	0.0
DesignQueue:	12	0	1	0	0	0	0	2	0	0	7	0

YEAR 2010 WITH PROJECT MITIGATED CONDITIONS

LEVEL OF SERVICE ANALYSIS

Level of Service calculation sheets are provided, based on the presence of the intersection mitigation measures referred to in the text.

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
AM Peak Hour

Scenario Report

Scenario: 2010 Project AM

Command: 2010 Project AM
Volume: 2010 Base AM
Geometry: Default Geometry
Impact Fee: Default Impact Fee
Trip Generation: Bus. Park - AM Peak
Trip Distribution: Default Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Default Configuration

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
AM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base		Future		Change in
	LOS	Del/V	LOS	Del/V	
# 1 EAST SECOND / I-780 EB RAMP	B	14.3 0.504	C	18.2 0.785	+ 3.880 D/V
# 2 EAST SECOND / I-780 WB RAMP	C	17.3 0.588	C	17.1 0.667	0.182 D/V
# 3 EAST SECOND / ROSE	B	11.8 0.217	B	13.7 0.579	+ 1.896 D/V
# 4 EAST SECOND / INDUSTRIAL	B	10.9 0.383	D	27.4 0.908	+16.458 D/V
# 5 EAST SECOND / LAKE HERMAN	A	4.0 0.543	B	10.1 0.694	+ 6.141 D/V
# 6 I-680 SB RAMP / LAKE HERMAN	B	14.1 0.415	C	15.2 0.628	+ 1.190 D/V
# 7 I-680 NB RAMP / LAKE HERMAN	B	13.5 0.541	B	14.4 0.583	+ 0.900 D/V
# 8 PARK / INDUSTRIAL	B	14.1 0.606	C	15.9 0.718	+ 1.791 D/V
# 9 I-680 SB OFF / INDUSTRIAL	B	13.2 0.640	B	13.2 0.640	+ 0.000 D/V
# 10 I-680 NB ON / INDUSTRIAL	A	1.2 0.380	A	1.2 0.380	+ 0.000 D/V
# 11 PARK / BAYSHORE	B	13.1 0.829	D	29.0 1.078	+15.981 D/V
# 12 I-680 SB ON / BAYSHORE	A	1.0 0.420	A	1.1 0.652	+ 0.038 D/V
# 13 I-680 NB OFF / BAYSHORE	A	3.0 0.464	A	3.1 0.704	+ 0.137 D/V

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
AM Peak Hour

Level of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I-780 EB RAMP

Cycle (sec): 90 Critical Vol./Cap. (X): 0.785
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 18.2
Optimal Cycle: 63 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	20	20	5	30	0	0	0	0	15	0	15
Lanes:	0	0	2	0	1	1	0	2	0	0	0	2

Volume Module:												
Base Vol:	0	312	126	406	404	0	0	0	0	217	0	288
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	312	126	406	404	0	0	0	0	217	0	288
Added Vol:	0	235	0	46	114	0	0	0	0	0	0	481
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	547	126	452	518	0	0	0	0	217	0	769
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	576	133	476	545	0	0	0	0	228	0	809
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	576	133	476	545	0	0	0	0	228	0	809
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.00	1.00	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.13
Final Vol:	0	605	133	476	573	0	0	0	0	228	0	915

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00
Final Sat:	0	3800	1615	1805	3800	0	0	0	0	1805	0	3230

Capacity Analysis Module:												
Vol/Sat:	0.00	0.16	0.08	0.26	0.15	0.00	0.00	0.00	0.00	0.13	0.00	0.28
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	0.0	20.0	20.0	29.4	49.4	0.0	0.0	0.0	0.0	31.6	0.0	31.6
Volume/Cap:	0.00	0.72	0.37	0.81	0.27	0.00	0.00	0.00	0.00	0.36	0.00	0.81
Delay/Veh:	0.0	23.0	19.5	23.6	7.0	0.0	0.0	0.0	0.0	14.2	0.0	20.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	23.0	19.5	23.6	7.0	0.0	0.0	0.0	0.0	14.2	0.0	20.2
DesignQueue:	0	25	5	17	13	0	0	0	0	8	0	32

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
AM Peak Hour

Level of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #2 EAST SECOND / I-780 WB RAMP

Cycle (sec): 100 Critical Vol./Cap. (X): 0.667
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 17.1
Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	1	0	2	0	2	0	1

Volume Module:	>> Count Date: 19 May 1999 <<											
Base Vol:	249	335	0	0	432	304	0	0	0	413	0	406
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	249	335	0	0	432	304	0	0	0	413	0	406
Added Vol:	0	716	0	0	160	205	0	0	0	0	0	15
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	249	1051	0	0	592	509	0	0	0	413	0	421
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	262	1106	0	0	623	536	0	0	0	435	0	443
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	262	1106	0	0	623	536	0	0	0	435	0	443
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.05	1.05	1.00	1.05	1.13	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol:	262	1162	0	0	654	605	0	0	0	448	0	443

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	1.00	2.00	0.00	1.00	2.00	2.00	0.00	0.00	0.00	2.00	1.00	1.00
Final Sat:	1805	3800	0	1900	3800	3230	0	0	0	3610	1900	1615

Capacity Analysis Module:												
Vol/Sat:	0.15	0.31	0.00	0.00	0.17	0.19	0.00	0.00	0.00	0.12	0.00	0.27
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	21.8	49.9	0.0	0.0	28.1	28.1	0.0	0.0	0.0	41.1	0.0	41.1
Volume/Cap:	0.67	0.61	0.00	0.00	0.61	0.67	0.00	0.00	0.00	0.30	0.00	0.67
Delay/Veh:	26.1	12.1	0.0	0.0	20.9	21.9	0.0	0.0	0.0	12.8	0.0	17.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.1	12.1	0.0	0.0	20.9	21.9	0.0	0.0	0.0	12.8	0.0	17.2
DesignQueue:	12	35	0	0	27	25	0	0	0	15	0	15

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #3 EAST SECOND / ROSE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.579
Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 13.7
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Ovl			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	2	0	2	0	0	2	0	0	0	1	0	0

Volume Module: >> Count Date: 19 May 1999 <<
Base Vol: 169 332 0 0 230 105 300 0 358 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 169 332 0 0 230 0 300 0 358 0 0 0
Added Vol: 45 687 0 0 228 166 442 0 136 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 214 1019 0 0 458 0 742 0 494 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 214 1019 0 0 458 0 742 0 494 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 214 1019 0 0 458 0 742 0 494 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.03 1.05 1.00 1.00 1.05 0.00 1.03 1.00 1.00 1.00 1.00 1.00
Final Vol: 220 1070 0 0 481 0 764 0 494 0 0 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 1.00 1.00 1.00 0.95 1.00 0.85 1.00 1.00 1.00
Lanes: 2.00 2.00 0.00 0.00 2.00 1.00 2.00 0.00 1.00 0.00 0.00 0.00
Final Sat: 3610 3800 0 0 3800 1900 3610 0 1615 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.06 0.28 0.00 0.00 0.13 0.00 0.21 0.00 0.31 0.00 0.00 0.00
Crit Moves: ****
Green Time: 28.7 48.7 0.0 0.0 20.0 0.0 42.3 0.0 71.0 0.0 0.0 0.0
Volume/Cap: 0.21 0.58 0.00 0.00 0.63 0.00 0.50 0.00 0.43 0.00 0.00 0.00
Delay/Veh: 17.5 12.2 0.0 0.0 24.9 0.0 13.8 0.0 4.1 0.0 0.0 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 17.5 12.2 0.0 0.0 24.9 0.0 13.8 0.0 4.1 0.0 0.0 0.0
DesignQueue: 9 33 0 0 22 0 26 0 9 0 0 0

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
AM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #4 EAST SECOND / INDUSTRIAL

Cycle (sec): 120 Critical Vol./Cap. (X): 0.908
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 27.4
Optimal Cycle: 120 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Include			Include		
Min. Green:	5	5	5	5	5	5	5	5	5	5	5	5
Lanes:	2	0	2	0	1	1	0	2	0	1	1	0

Volume Module:
Base Vol: 5 319 344 82 264 515 200 3 7 53 9 12
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 319 344 82 264 515 200 3 7 53 9 12
Added Vol: 544 585 0 0 258 237 59 134 136 0 535 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 549 904 344 82 522 752 259 137 143 53 544 12
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 578 952 362 86 549 792 273 144 151 56 573 13
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 578 952 362 86 549 792 273 144 151 56 573 13
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.03 1.05 1.00 1.00 1.05 1.00 1.00 1.10 1.10 1.03 1.05 1.05
Final Vol: 595 999 362 86 577 792 273 159 166 57 601 13

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.95 0.92 0.92 0.95 1.00 1.00
Lanes: 2.00 2.00 1.00 1.00 2.00 1.00 1.00 1.47 1.53 2.00 1.96 0.04
Final Sat: 3610 3800 1615 1805 3800 1615 1805 2566 2678 3610 3720 80

Capacity Analysis Module:
Vol/Sat: 0.16 0.26 0.22 0.05 0.15 0.49 0.15 0.06 0.06 0.02 0.16 0.16
Crit Moves: ****
Green Time: 21.8 56.4 61.4 10.2 44.8 64.8 20.0 36.4 36.4 5.0 21.4 21.4
Volume/Cap: 0.91 0.56 0.44 0.56 0.41 0.91 0.91 0.20 0.20 0.38 0.91 0.91
Delay/Veh: 42.9 15.1 12.2 37.4 18.0 25.5 52.5 20.1 20.1 37.0 42.7 42.7
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 42.9 15.1 12.2 37.4 18.0 25.5 52.5 20.1 20.1 37.0 42.7 42.7
DesignQueue: 34 38 12 5 25 27 16 8 8 4 34 1

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #5 EAST SECOND / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.694
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 10.1
Optimal Cycle: 70 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	2	0	1	0

Volume Module:												
Base Vol:	16	8	242	1	15	3	8	45	29	392	1444	43
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	8	242	1	15	3	8	45	29	392	1444	43
Added Vol:	302	0	107	0	0	0	0	119	195	361	214	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	318	8	349	1	15	3	8	164	224	753	1678	43
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	335	8	367	1	16	3	8	173	236	793	1766	45
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	335	8	367	1	16	3	8	173	236	793	1766	45
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.05	1.05
Final Vol.:	345	8	367	1	16	3	8	181	236	816	1855	48

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.98	0.98	0.95	1.00	0.85	0.95	1.00	1.00
Lanes:	2.00	1.00	1.00	1.00	0.84	0.16	1.00	2.00	1.00	2.00	1.95	0.05
Final Sat.:	3610	1900	1615	1805	1568	294	1805	3800	1615	3610	3704	96

Capacity Analysis Module:												
Vol/Sat:	0.10	0.00	0.23	0.00	0.01	0.01	0.00	0.05	0.15	0.23	0.50	0.50
Crit Moves:	****			****			****			****		
Green Time:	13.8	13.5	72.9	1.8	1.5	1.5	0.6	13.3	27.1	59.5	72.1	72.1
Volume/Cap:	0.69	0.03	0.31	0.03	0.69	0.69	0.69	0.36	0.54	0.38	0.69	0.69
Delay/Veh:	29.4	24.3	3.1	31.2	65.1	65.1	92.3	25.7	21.2	6.9	5.6	5.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.4	24.3	3.1	31.2	65.1	65.1	92.3	25.7	21.2	6.9	5.6	5.6
DesignQueue:	17	0	6	0	1	0	0	9	10	19	33	1

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #6 I 680 SB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.628
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 15.2
Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	2	0	1	0	0

Volume Module: >> Count Date: 20 May 1999 <<												
Base Vol:	0	0	0	102	0	553	0	246	57	61	431	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	102	0	553	0	246	57	61	431	0
Added Vol:	0	0	0	0	0	419	0	148	78	0	157	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	102	0	992	0	394	135	61	588	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	107	0	1044	0	415	142	64	619	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	107	0	1044	0	415	142	64	619	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.05	1.00	1.00	1.05	1.00
Final Vol.:	0	0	0	107	0	1096	0	435	142	64	650	0

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.86	1.00	0.86	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	0.16	0.00	1.84	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	0	267	0	3001	0	3800	1615	1805	3800	0

Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.40	0.00	0.37	0.00	0.11	0.09	0.04	0.17	0.00
Crit Moves:	****			****			****			****		
Green Time:	0.0	0.0	0.0	63.8	0.0	63.8	0.0	20.8	20.8	6.4	27.2	0.0
Volume/Cap:	0.00	0.00	0.00	0.63	0.00	0.57	0.00	0.55	0.42	0.55	0.63	0.00
Delay/Veh:	0.0	0.0	0.0	7.5	0.0	7.0	0.0	23.5	22.8	33.4	21.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	7.5	0.0	7.0	0.0	23.5	22.8	33.4	21.5	0.0
DesignQueue:	0	0	0	2	0	24	0	20	6	3	28	0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #7 I 680 NB RAMPS / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.583
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 14.4
Optimal Cycle: 60 Level Of Service: H

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	1	0	0	1	0	0	1	0	0

Volume Module: >> Count Date: 20 May 1999 <<

Base Vol:	465	332	237	9	3	14	29	165	126	85	146	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	465	332	237	9	3	14	29	165	126	85	146	0
Added Vol:	157	0	0	0	0	0	0	0	148	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	622	332	237	9	3	14	29	165	274	85	146	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	655	349	249	9	3	15	31	174	288	89	154	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	655	349	249	9	3	15	31	174	288	89	154	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.00	1.00
Final Vol:	674	349	249	9	3	15	31	182	303	89	154	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.96	0.96	0.85	0.95	0.91	0.91	0.95	1.00	1.00
Lanes:	2.00	0.58	0.42	0.75	0.25	1.00	1.00	0.75	1.25	1.00	1.00	0.00
Final Sat:	3610	1042	744	1368	456	1615	1805	1298	2160	1805	1900	0

Capacity Analysis Module:

Vol/Sat:	0.19	0.33	0.33	0.01	0.01	0.01	0.02	0.14	0.14	0.05	0.08	0.00
Crit Moves:	****											
Green Time:	55.7	57.4	57.4	1.1	2.8	2.8	5.7	24.0	24.0	8.5	26.8	0.0
Volume/Cap:	0.33	0.58	0.58	0.58	0.24	0.33	0.30	0.58	0.58	0.58	0.30	0.00
Delay/Veh:	7.8	9.5	9.5	53.9	31.2	32.5	29.8	22.5	22.5	32.5	18.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	7.8	9.5	9.5	53.9	31.2	32.5	29.8	22.5	22.5	32.5	18.9	0.0
DesignQueue:	17	9	6	0	0	1	2	8	13	5	6	0

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1994 HCM Operations Method (Future Volume Alternative)

Intersection #8 PARK / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.718
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 15.9
Optimal Cycle: 62 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	1	0	0	1	0	0	1	0	0

Volume Module:

Base Vol:	456	246	522	40	195	5	4	25	121	277	95	308
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	456	246	522	40	195	5	4	25	121	277	95	308
Added Vol:	535	275	0	0	78	0	0	0	114	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	991	521	522	40	273	5	4	25	255	277	95	308
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1043	548	549	42	287	5	4	26	268	292	100	324
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1043	548	549	42	287	5	4	26	268	292	100	324
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.05	1.05	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol:	1074	548	549	42	302	6	4	26	268	300	100	324

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	1.00	0.95	1.00	0.85	0.95	0.89	0.89
Lanes:	2.00	1.00	1.00	1.00	1.96	0.04	1.00	1.00	1.00	2.00	0.24	0.76
Final Sat:	3610	1900	1615	1805	1726	74	1805	1900	1615	3610	399	1292

Capacity Analysis Module:

Vol/Sat:	0.30	0.29	0.34	0.02	0.08	0.08	0.00	0.01	0.17	0.08	0.25	0.25
Crit Moves:	****											
Green Time:	41.5	48.8	79.1	3.9	11.3	11.3	0.3	5.0	46.4	30.3	34.9	34.9
Volume/Cap:	0.72	0.59	0.43	0.59	0.72	0.72	0.72	0.27	0.36	0.27	0.72	0.72
Delay/Veh:	16.9	12.6	2.3	38.9	31.6	31.6	137.3	30.0	11.2	17.2	21.1	21.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	16.9	12.6	2.3	38.9	31.6	31.6	137.3	30.0	11.2	17.2	21.1	21.1
DesignQueue:	38	17	7	2	15	0	0	0	1	8	12	4

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1994 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-680 SB OFF / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.640
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 13.2
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module: >> Count Date: 20 May 1999 <<
Base Vol: 0 0 0 57 0 395 0 587 0 0 285 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 0 0 57 0 395 0 587 0 0 285 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 0 0 57 0 395 0 587 0 0 285 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 0 0 0 60 0 416 0 618 0 0 300 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 0 0 60 0 416 0 618 0 0 300 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 0 0 0 60 0 416 0 618 0 0 300 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 1.00 1.00 1.00 0.95 1.00 0.85 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.00 0.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 0.00 1.00 0.00
Final Sat.: 0 0 0 1805 0 1615 0 1900 0 0 1900 0

Capacity Analysis Module:
Vol/Sat: 0.00 0.00 0.00 0.03 0.00 0.26 0.00 0.33 0.00 0.00 0.16 0.00
Crit Moves: ****
Green Time: 0.0 0.0 0.0 40.2 0.0 40.2 0.0 50.8 0.0 0.0 50.8 0.0
Volume/Cap: 0.00 0.00 0.00 0.08 0.00 0.64 0.00 0.64 0.00 0.00 0.31 0.00
Delay/Veh: 0.0 0.0 0.0 11.9 0.0 17.1 0.0 12.6 0.0 0.0 9.4 0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 0.0 0.0 11.9 0.0 17.1 0.0 12.6 0.0 0.0 9.4 0.0
DesignQueue: 0 0 0 2 0 15 0 18 0 0 9 0

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Intersection #10 I-680 NB ON / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.380
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 1.2
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module:
Base Vol: 0 0 0 0 0 0 20 624 0 0 350 16
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 0 0 0 0 0 20 624 0 0 350 16
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 0 0 0 0 0 20 624 0 0 350 16
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 0 0 0 0 0 0 21 657 0 0 368 17
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 0 0 0 0 0 21 657 0 0 368 17
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.: 0 0 0 0 0 0 21 657 0 0 368 17

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 0.95 1.00 1.00 1.00 1.00 0.85
Lanes: 0.00 0.00 0.00 0.00 0.00 0.00 1.00 1.00 0.00 0.00 1.00 1.00
Final Sat.: 0 0 0 0 0 0 1805 1900 0 0 1900 1615

Capacity Analysis Module:
Vol/Sat: 0.00 0.00 0.00 0.00 0.00 0.00 0.01 0.35 0.00 0.00 0.19 0.01
Crit Moves: ****
Green Time: 0.0 0.0 0.0 0.0 0.0 0.0 5.2 91.0 0.0 0.0 85.8 85.8
Volume/Cap: 0.00 0.00 0.00 0.00 0.00 0.00 0.23 0.38 0.00 0.00 0.23 0.01
Delay/Veh: 0.0 0.0 0.0 0.0 0.0 0.0 29.6 0.5 0.0 0.0 0.8 0.7
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 0.0 0.0 0.0 0.0 0.0 29.6 0.5 0.0 0.0 0.8 0.7
DesignQueue: 0 0 0 0 0 0 1 4 0 0 3 0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #11 PARK / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 1.078
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 29.0
Optimal Cycle: 120 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ovl			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	1	0	0	2	0	1	0	0	0

Volume Module:

Base Vol:	78	23	16	633	140	729	18	49	44	243	30	1083
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	23	16	633	140	729	18	49	44	243	30	1083
Added Vol:	0	60	0	187	24	0	0	0	0	0	0	750
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	83	16	820	164	729	18	49	44	243	30	1833
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	82	87	17	863	173	767	19	52	46	256	32	1929
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	87	17	863	173	767	19	52	46	256	32	1929
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.13
Final Vol:	82	87	17	889	173	767	19	52	46	256	32	2180

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.98	0.98	0.95	1.00	0.85	0.84	0.84	0.84	0.96	0.96	0.85
Lanes:	1.00	0.84	0.16	2.00	1.00	1.00	0.16	0.45	0.39	0.89	0.11	2.00
Final Sat:	1805	1558	304	3610	1900	1615	260	711	629	1621	203	3230

Capacity Analysis Module:

Vol/Sat:	0.05	0.06	0.06	0.25	0.09	0.47	0.07	0.07	0.07	0.16	0.16	0.67
Crit Moves:	****			****		****						****
Green Time:	4.2	7.7	7.7	33.8	37.3	44.0	6.8	6.8	6.8	39.7	39.7	73.5
Volume/Cap:	1.08	0.73	0.73	0.73	0.24	1.08	1.08	1.08	1.08	0.40	0.40	0.92
Delay/Veh:	143.9	40.4	40.4	20.3	14.0	68.9	127.7	128	127.7	14.1	14.1	11.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	143.9	40.4	40.4	20.3	14.0	68.9	127.7	128	127.7	14.1	14.1	11.5
DesignQueue:	4	5	1	35	6	27	1	3	2	9	1	38

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #12 I-680 SB ON / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.652
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 1.1
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	1	1	0

Volume Module:

Base Vol:	0	0	0	0	0	0	0	54	549	42	1356	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	54	549	42	1356	0
Added Vol:	0	0	0	0	0	0	0	0	187	0	750	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	0	54	736	42	2106	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	0	57	775	44	2217	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	0	57	775	44	2217	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.00
Final Vol:	0	0	0	0	0	0	0	60	813	44	2328	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	1.86	1.00	2.00	0.00
Final Sat:	0	0	0	0	0	0	0	225	3043	1805	3800	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.02	0.61	0.00
Crit Moves:	****			****		****						****
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.1	86.1	7.9	94.0	0.0
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.65	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	28.5	0.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	28.5	0.6	0.0
DesignQueue:	0	0	0	0	0	0	0	7	2	9	0	0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.704
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 3.1
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Protected			Protected			Protected			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	
Lanes:	2	0	0	0	1	0	0	0	0	0	1	0	0

Volume Module:	North Bound			South Bound			East Bound			West Bound		
Base Vol:	1310	0	548	0	0	0	0	78	0	0	46	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1310	0	548	0	0	0	0	78	0	0	46	0
Added Vol:	750	0	0	0	0	0	0	0	0	0	0	0
PassesByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2060	0	548	0	0	0	0	78	0	0	46	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	2168	0	577	0	0	0	0	82	0	0	48	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2168	0	577	0	0	0	0	82	0	0	48	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00
Final Vol:	2233	0	577	0	0	0	0	82	0	0	51	0

Saturation Flow Module:	North Bound			South Bound			East Bound			West Bound		
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00
Final Sat:	3610	0	1615	0	0	0	0	1900	0	0	3800	0

Capacity Analysis Module:	North Bound			South Bound			East Bound			West Bound		
Vol/Sat:	0.62	0.00	0.36	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00
Crit Moves:	****			****			****			****		
Green Time:	87.9	0.0	87.9	0.0	0.0	0.0	0.0	6.1	0.0	0.0	6.1	0.0
Volume/Cap:	0.70	0.00	0.41	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.22	0.00
Delay/Veh:	1.8	0.0	0.8	0.0	0.0	0.0	0.0	41.2	0.0	0.0	28.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.8	0.0	0.8	0.0	0.0	0.0	0.0	41.2	0.0	0.0	28.9	0.0
DesignQueue:	18	0	4	0	0	0	0	4	0	0	3	0

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
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Scenario Report

Scenario: 2010 Project PM

Command: 2010 Project PM
Volume: 2010 Base PM
Geometry: Default Geometry
Impact Fee: Default Impact Fee
Trip Generation: Bus, Park PM Peak
Trip Distribution: Default Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Default Configuration

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
PM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base		Future		Change in
	Del/V/ LOS Veh C		Del/V/ LOS Veh C		
# 1 EAST SECOND / I 780 EB RAMPS	B 11.2	0.407	B 12.8	0.495	+ 1.590 D/V
# 2 EAST SECOND / I 780 WB RAMPS	C 18.0	0.618	C 20.3	0.888	+ 2.295 D/V
# 3 EAST SECOND / ROSE	B 11.8	0.273	C 15.6	0.708	+ 3.824 D/V
# 4 EAST SECOND / INDUSTRIAL	C 15.6	0.353	D 29.2	0.910	+13.688 D/V
# 5 EAST SECOND / LAKE HERMAN	B 12.4	0.545	C 23.2	0.977	+10.721 D/V
# 6 I 680 SB RAMPS / LAKE HERMAN	B 11.4	0.334	B 12.3	0.593	+ 0.820 D/V
# 7 I-680 NB RAMPS / LAKE HERMAN	C 19.1	0.560	C 23.8	0.837	+ 4.688 D/V
# 8 PARK / INDUSTRIAL	C 17.9	0.559	D 34.1	0.972	+16.221 D/V
# 9 I 680 SB OFF / INDUSTRIAL	A 4.1	0.479	A 4.1	0.479	+ 0.000 D/V
# 10 I 680 NB ON / INDUSTRIAL	B 6.3	0.536	B 6.3	0.536	+ 0.000 D/V
# 11 PARK / BAYSHORE	C 17.9	0.758	E 45.1	1.072	+27.199 D/V
# 12 I 680 SB ON / BAYSHORE	A 1.8	0.465	A 2.6	0.763	+ 0.776 D/V
# 13 I 680 NB OFF / BAYSHORE	A 4.6	0.377	A 4.2	0.443	0.397 D/V

Benicia Business Park EIR
2010 Project Conditions w/ Mitigations
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Level of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #1 EAST SECOND / I 780 EB RAMP

Cycle (sec): 90 Critical Vol./Cap. (X): 0.495
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 12.8
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	20	20	5	30	0	0	0	0	15	0	15
Lanes:	0	0	2	0	1	1	0	2	0	0	0	2

Volume Module: 4:00 - 6:00 PM
Base Vol: 0 531 141 192 722 0 0 0 0 172 0 162
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 531 141 192 722 0 0 0 0 172 0 162
Added Vol: 0 214 0 29 343 0 0 0 0 0 0 293
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 745 141 221 1065 0 0 0 0 172 0 455
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 0 784 148 233 1121 0 0 0 0 181 0 479
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 784 148 233 1121 0 0 0 0 181 0 479
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.05 1.00 1.00 1.05 1.00 1.00 1.00 1.00 1.00 1.00 1.13
Final Vol.: 0 823 148 233 1177 0 0 0 0 181 0 541

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 1.00 1.00 0.85 0.95 1.00 1.00 1.00 1.00 1.00 0.95 1.00 0.85
Lanes: 0.00 2.00 1.00 1.00 2.00 0.00 0.00 0.00 0.00 1.00 0.00 2.00
Final Sat.: 0 3800 1615 1805 3800 0 0 0 0 1805 0 3230

Capacity Analysis Module:
Vol/Sat: 0.00 0.22 0.09 0.13 0.31 0.00 0.00 0.00 0.00 0.10 0.00 0.17
Crit Moves: ****
Green Time: 0.0 39.3 39.3 23.4 62.8 0.0 0.0 0.0 0.0 18.2 0.0 18.2
Volume/Cap: 0.00 0.50 0.21 0.50 0.44 0.00 0.00 0.00 0.00 0.50 0.00 0.83
Delay/Veh: 0.0 12.0 10.2 19.0 3.9 0.0 0.0 0.0 0.0 21.5 0.0 28.3
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 12.0 10.2 19.0 3.9 0.0 0.0 0.0 0.0 21.5 0.0 28.3
DesignQueue: 0 25 4 9 19 0 0 0 0 7 0 22

Benicia Business Park EIR
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Level of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #2 EAST SECOND / I 780 WB RAMP

Cycle (sec): 100 Critical Vol./Cap. (X): 0.888
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 20.3
Optimal Cycle: 97 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	1	0	2	0	0	0	0

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM
Base Vol: 332 395 0 0 489 335 0 0 0 666 0 348
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 332 395 0 0 489 335 0 0 0 666 0 348
Added Vol: 0 507 0 0 372 625 0 0 0 0 0 53
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 332 902 0 0 861 960 0 0 0 666 0 401
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 349 949 0 0 906 1011 0 0 0 701 0 422
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 349 949 0 0 906 1011 0 0 0 701 0 422
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.05 1.05 1.00 1.05 1.13 1.00 1.00 1.00 1.03 1.00 1.00
Final Vol.: 349 997 0 0 952 1142 0 0 0 722 0 422

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 1.00 1.00 0.85 1.00 1.00 1.00 0.95 1.00 0.85
Lanes: 1.00 2.00 0.00 1.00 2.00 2.00 0.00 0.00 0.00 2.00 1.00 1.00
Final Sat.: 1805 3800 0 1900 3800 3230 0 0 0 3610 1900 1615

Capacity Analysis Module:
Vol/Sat: 0.19 0.26 0.00 0.00 0.25 0.35 0.00 0.00 0.00 0.20 0.00 0.26
Crit Moves: ****
Green Time: 21.8 61.6 0.0 0.0 39.8 39.8 0.0 0.0 0.0 29.4 0.0 29.4
Volume/Cap: 0.89 0.43 0.00 0.00 0.63 0.89 0.00 0.00 0.00 0.68 0.00 0.89
Delay/Veh: 39.3 6.5 0.0 0.0 16.2 23.8 0.0 0.0 0.0 21.4 0.0 34.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 39.3 6.5 0.0 0.0 16.2 23.8 0.0 0.0 0.0 21.4 0.0 34.6
DesignQueue: 16 23 0 0 34 41 0 0 0 30 0 18

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #3 EAST SECOND / ROSE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.708
Loss Time (sec): 9 (Y+R = 5 sec) Average Delay (sec/veh): 15.6
Optimal Cycle: 60 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Ovl			Include		
Min. Green:	5	20	0	0	20	20	21	0	21	0	0	0
Lanes:	2	0	2	0	0	1	2	0	0	0	1	0

Volume Module: >> Count Date: 19 May 1999 << 4:00 - 6:00 PM

Base Vol:	454	291	0	0	312	379	113	0	134	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	454	291	0	0	312	0	113	0	134	0	0	0
Added Vol:	156	404	0	0	911	630	352	0	86	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	610	695	0	0	1223	0	465	0	220	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	610	695	0	0	1223	0	465	0	220	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	610	695	0	0	1223	0	465	0	220	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.05	1.00	1.00	1.05	0.00	1.03	1.00	1.00	1.00	1.00	1.00
Final Vol.:	628	730	0	0	1284	0	479	0	220	0	0	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	0.00	0.00	2.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	3610	3800	0	0	3800	1900	3610	0	1615	0	0	0

Capacity Analysis Module:

Vol/Sat:	0.17	0.19	0.00	0.00	0.34	0.00	0.13	0.00	0.14	0.00	0.00	0.00
Crit Moves:	****			****		****						
Green Time:	23.8	70.0	0.0	0.0	46.2	0.0	21.0	0.0	44.8	0.0	0.0	0.0
Volume/Cap:	0.73	0.27	0.00	0.00	0.73	0.00	0.63	0.00	0.30	0.00	0.00	0.00
Delay/Veh:	25.0	3.6	0.0	0.0	15.2	0.0	24.5	0.0	11.5	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.0	3.6	0.0	0.0	15.2	0.0	24.5	0.0	11.5	0.0	0.0	0.0
DesignQueue:	28	13	0	0	42	0	22	0	7	0	0	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #4 EAST SECOND / INDUSTRIAL

Cycle (sec): 120 Critical Vol./Cap. (X): 0.910
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 29.2
Optimal Cycle: 120 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Include			Include		
Min. Green:	5	5	5	5	5	5	5	5	5	5	5	5
Lanes:	2	0	2	0	1	1	0	2	0	1	1	1

Volume Module: 4:00 - 6:00 PM

Base Vol:	34	362	94	3	212	248	111	17	88	600	14	28
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	362	94	3	212	248	111	17	88	600	14	28
Added Vol:	148	607	0	0	948	65	258	583	593	0	146	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	182	969	94	3	1160	313	369	600	681	600	160	28
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	192	1020	99	3	1221	329	388	632	717	632	168	29
Reduct Vol:	0	0	0	0	0	0	0	0	159	0	0	0
Reduced Vol:	192	1020	99	3	1221	329	388	632	558	632	168	29
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.05	1.00	1.00	1.05	1.00	1.00	1.10	1.10	1.03	1.05	1.05
Final Vol.:	197	1071	99	3	1282	329	388	695	614	651	177	31

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.93	0.93	0.95	0.98	0.98
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	1.00	1.59	1.41	2.00	1.70	0.30
Final Sat.:	3610	3800	1615	1805	3800	1615	1805	2815	2486	3610	3169	555

Capacity Analysis Module:

Vol/Sat:	0.05	0.28	0.06	0.00	0.34	0.20	0.21	0.25	0.25	0.18	0.06	0.06
Crit Moves:	****			****		****				****		
Green Time:	7.2	46.7	70.4	5.0	44.5	89.2	44.7	32.6	32.6	23.8	11.6	11.6
Volume/Cap:	0.91	0.72	0.10	0.04	0.91	0.27	0.58	0.91	0.91	0.91	0.58	0.58
Delay/Veh:	62.7	21.4	7.0	35.7	29.7	3.2	20.4	33.8	33.8	41.7	35.2	35.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.7	21.4	7.0	35.7	29.7	3.2	20.4	33.8	33.8	41.7	35.2	35.2
DesignQueue:	13	47	3	0	59	6	17	36	32	36	11	2

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #5 EAST SECOND / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.977
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 23.2
Optimal Cycle: 120 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	2	0	1	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	117	87	536	20	20	12	20	19	16	275	493	140
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	117	87	536	20	20	12	20	19	16	275	493	140
Added Vol:	561	0	399	0	0	0	0	412	663	118	334	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	678	87	935	20	20	12	20	431	679	393	827	140
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	714	92	984	21	21	13	21	454	715	414	871	147
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	714	92	984	21	21	13	21	454	715	414	871	147
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.03	1.05	1.05
Final Vol:	735	92	984	21	21	13	21	476	715	426	914	155

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.94	0.94	0.95	1.00	0.85	0.95	0.98	0.98
Lanes:	2.00	1.00	1.00	1.00	0.62	0.38	1.00	2.00	1.00	2.00	1.71	0.29
Final Sat:	3610	1900	1615	1805	1103	683	1805	3800	1615	3610	3184	540

Capacity Analysis Module:

Vol/Sat:	0.20	0.05	0.61	0.01	0.02	0.02	0.01	0.13	0.44	0.12	0.29	0.29
Crit Moves:	****			****			****			****		
Green Time:	47.1	50.3	62.3	1.2	4.4	4.4	1.4	24.5	71.5	12.1	35.1	35.1
Volume/Cap:	0.43	0.10	0.98	0.98	0.43	0.43	0.82	0.51	0.62	0.98	0.82	0.82
Delay/Veh:	11.5	8.4	28.9	169.2	32.5	32.5	95.8	21.5	5.4	56.1	22.0	22.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.5	8.4	28.9	169.2	32.5	32.5	95.8	21.5	5.4	56.1	22.0	22.0
DesignQueue:	23	3	24	1	1	1	1	21	13	21	16	6

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #6 I 680 SB RAMPS / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.593
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 12.3
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	0	0	0	0	0	0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	0	0	0	33	0	223	0	473	129	120	643	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	33	0	223	0	473	129	120	643	0
Added Vol:	0	0	0	0	0	229	0	542	268	0	223	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	33	0	452	0	1015	397	120	866	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	35	0	476	0	1068	418	126	912	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	35	0	476	0	1068	418	126	912	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.05	1.00	1.00	1.05	1.00
Final Vol:	0	0	0	35	0	500	0	1122	418	126	957	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.86	1.00	0.86	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	0.12	0.00	1.88	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat:	0	0	0	201	0	3067	0	3800	1615	1805	3800	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.17	0.00	0.16	0.00	0.30	0.26	0.07	0.25	0.00
Crit Moves:	****			****			****			****		
Green Time:	0.0	0.0	0.0	29.4	0.0	29.4	0.0	49.8	49.8	11.8	61.6	0.0
Volume/Cap:	0.00	0.00	0.00	0.59	0.00	0.55	0.00	0.59	0.52	0.59	0.41	0.00
Delay/Veh:	0.0	0.0	0.0	20.3	0.0	19.8	0.0	11.9	11.5	30.2	6.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	20.3	0.0	19.8	0.0	11.9	11.5	30.2	6.4	0.0
DesignQueue:	0	0	0	1	0	20	0	34	12	6	22	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #7 I 680 NB RAMP / LAKE HERMAN

Cycle (sec): 100 Critical Vol./Cap. (X): 0.837
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 21.8
Optimal Cycle: 78 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	1	0	0	1	0	0	1	1	0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	505	15	78	2	3	60	27	70	434	258	249	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	505	15	78	2	3	60	27	70	434	258	249	0
Added Vol:	223	0	0	0	0	0	0	0	542	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	728	15	78	2	3	60	27	70	976	258	249	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	766	16	82	2	3	63	28	74	1027	272	262	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	766	16	82	2	3	63	28	74	1027	272	262	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.00	1.00
Final Vol:	789	16	82	2	3	63	28	77	1079	272	262	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.98	0.98	0.85	0.95	0.86	0.86	0.95	1.00	1.00
Lanes:	2.00	0.16	0.84	0.40	0.60	1.00	1.00	0.13	1.87	1.00	1.00	0.00
Final Sat:	3610	270	1383	745	1117	1615	1805	218	3050	1805	1900	0

Capacity Analysis Module:

Vol/Sat:	0.22	0.06	0.06	0.00	0.00	0.04	0.02	0.35	0.35	0.15	0.14	0.00
Crit Moves:	****					****				****		
Green Time:	26.1	29.4	29.4	1.3	4.7	4.7	6.1	42.2	42.2	18.0	54.1	0.0
Volume/Cap:	0.84	0.20	0.20	0.20	0.06	0.84	0.25	0.84	0.84	0.84	0.25	0.00
Delay/Veh:	27.3	17.1	17.1	32.1	29.4	65.7	29.2	20.0	20.0	37.4	7.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.3	17.1	17.1	32.1	29.4	65.7	29.2	20.0	20.0	37.4	7.9	0.0
DesignQueue:	34	1	3	0	0	3	1	3	38	13	7	0

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #8 PARK / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.972
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 34.1
Optimal Cycle: 120 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	1	0	1	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	478	181	464	58	421	22	36	98	135	547	98	203
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	478	181	464	58	421	22	36	98	135	547	98	203
Added Vol:	146	112	0	0	324	0	0	0	583	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	624	293	464	58	745	22	36	98	718	547	98	203
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	657	308	488	61	784	23	38	103	756	576	103	214
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	657	308	488	61	784	23	38	103	756	576	103	214
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.05	1.05	1.00	1.00	1.00	1.03	1.00	1.00
Final Vol:	677	308	488	61	823	24	38	103	756	593	103	214

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	1.00	0.95	1.00	0.85	0.95	0.90	0.90
Lanes:	2.00	1.00	1.00	1.00	1.94	0.06	1.00	1.00	1.00	2.00	0.32	0.68
Final Sat:	3610	1900	1615	1805	3692	108	1805	1900	1615	3610	556	1154

Capacity Analysis Module:

Vol/Sat:	0.19	0.16	0.30	0.03	0.22	0.22	0.02	0.05	0.47	0.16	0.19	0.19
Crit Moves:	****			****					****			
Green Time:	19.3	34.9	51.8	7.3	22.9	22.9	4.7	28.9	48.2	16.9	41.1	41.1
Volume/Cap:	0.97	0.46	0.58	0.46	0.97	0.97	0.45	0.19	0.97	0.97	0.45	0.45
Delay/Veh:	46.1	16.7	11.5	30.6	42.4	42.4	32.6	17.3	35.3	48.6	14.1	14.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.1	16.7	11.5	30.6	42.4	42.4	32.6	17.3	35.3	48.6	14.1	14.1
DesignQueue:	32	12	14	3	37	1	2	4	24	29	4	7

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #9 I-680 SB OFF / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.479
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 4.1
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	0	0	0	1	0	0	0

Volume Module: >> Count Date: 20 May 1999 << 4:00 - 6:00 PM

Base Vol:	0	0	0	11	0	86	0	685	0	0	669	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	11	0	86	0	685	0	0	669	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	11	0	86	0	685	0	0	669	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	12	0	91	0	721	0	0	704	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	12	0	91	0	721	0	0	704	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	12	0	91	0	721	0	0	704	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Final Sat.:	0	0	0	1805	0	1615	0	1900	0	0	1900	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.06	0.00	0.38	0.00	0.00	0.37	0.00
Crit Moves:				****	****			****				
Green Time:	0.0	0.0	0.0	11.8	0.0	11.8	0.0	79.2	0.0	0.0	79.2	0.0
Volume/Cap:	0.00	0.00	0.00	0.06	0.00	0.48	0.00	0.48	0.00	0.00	0.47	0.00
Delay/Veh:	0.0	0.0	0.0	25.3	0.0	28.1	0.0	2.4	0.0	0.0	2.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	25.3	0.0	28.1	0.0	2.4	0.0	0.0	2.4	0.0
DesignQueue:	0	0	0	1	0	5	0	9	0	0	9	0

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #10 I-680 NB ON / INDUSTRIAL

Cycle (sec): 100 Critical Vol./Cap. (X): 0.516
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 6.3
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	0	1	0	1	0	0	1

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	0	0	0	0	0	209	473	0	0	660	66
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	209	473	0	0	660	66
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	209	473	0	0	660	66
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	0	220	498	0	0	695	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	220	498	0	0	695	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	0	220	498	0	0	695	69

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.85
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Final Sat.:	0	0	0	0	0	0	1805	1900	0	0	1900	1615

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.26	0.00	0.00	0.37	0.04
Crit Moves:				****	****			****				
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	22.7	91.0	0.0	0.0	68.3	68.3
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.29	0.00	0.00	0.54	0.06
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	23.0	0.4	0.0	0.0	5.5	3.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	23.0	0.4	0.0	0.0	5.5	3.4
DesignQueue:	0	0	0	0	0	0	10	3	0	0	14	1

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #11 PARK / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 1.072
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 45.1
Optimal Cycle: 120 Level Of Service: E

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Ovl	Include	Ovl
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 0 1 0	2 0 1 0 1	0 0 1 0 0	0 1 0 0 2

Volume Module: 4:00 - 6:00 PM

Base Vol:	26	132	39	1012	57	45	50	98	44	226	20	854
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	132	39	1012	57	45	50	98	44	226	20	854
Added Vol:	0	54	0	817	90	0	0	0	0	0	0	204
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	26	186	39	1829	147	45	50	98	44	226	20	1058
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	27	196	41	1925	155	47	53	103	46	238	21	1114
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	196	41	1925	155	47	53	103	46	238	21	1114
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.13
Final Vol.:	27	196	41	1983	155	47	53	103	46	238	21	1258

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.97	0.97	0.95	1.00	0.85	0.86	0.86	0.86	0.96	0.96	0.85
Lanes:	1.00	0.83	0.17	2.00	1.00	1.00	0.26	0.51	0.23	0.92	0.08	2.00
Final Sat.:	1805	1524	319	3610	1900	1615	429	834	373	1676	148	3230

Capacity Analysis Module:

Vol/Sat:	0.01	0.13	0.13	0.55	0.08	0.03	0.12	0.12	0.12	0.14	0.14	0.39
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****
Green Time:	9.8	12.0	12.0	51.2	53.4	65.0	11.5	11.5	11.5	13.2	13.2	64.5
Volume/Cap:	0.15	1.07	1.07	1.07	0.15	0.04	1.07	1.07	1.07	1.07	1.07	0.60
Delay/Veh:	26.7	99.9	99.9	54.0	7.6	4.1	104.5	105	104.5	97.2	97.2	7.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.7	99.9	99.9	54.0	7.6	4.1	104.5	105	104.5	97.2	97.2	7.0
DesignQueue:	1	10	2	62	4	1	3	5	2	12	1	27

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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #12 I-680 SB ON / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.763
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 2.6
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 0 0 0 0	0 0 0 0 0	0 0 0 1 1	1 0 2 0 0

Volume Module: 4:00 - 6:00 PM

Base Vol:	0	0	0	0	39	1102	81	1074	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	39	1102	81	1074	0
Added Vol:	0	0	0	0	0	0	817	0	204
PasserByVol:	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	39	1919	81	1278	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	0	0	41	2020	85	1345
Reduct Vol:	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	41	2020	85	1345
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05
Final Vol.:	0	0	0	0	0	43	2121	85	1413

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.85	0.95
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	0.04	1.96	1.00
Final Sat.:	0	0	0	0	0	0	64	3166	1805

Capacity Analysis Module:

Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.67	0.05
Crit Moves:	****	****	****	****	****	****	****	****	****
Green Time:	0.0	0.0	0.0	0.0	0.0	0.0	87.8	87.8	6.2
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.76	0.40
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3	47.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3	47.0
DesignQueue:	0	0	0	0	0	0	0	17	4

Benicia Business Park EIR
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Level Of Service Computation Report
1994 HCM Operations Method (Future Volume Alternative)

Intersection #13 I-680 NB OFF / BAYSHORE

Cycle (sec): 100 Critical Vol./Cap. (X): 0.443
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 4.2
Optimal Cycle: 60 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Protected			Protected			Protected			Protected			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	
Lanes:	2	0	0	0	1	0	0	0	0	0	1	0	0

Volume Module: 4:00 - 6:00 PM

Base Vol:	1055	0	93	0	0	0	0	39	0	0	130	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1055	0	93	0	0	0	0	39	0	0	130	0
Added Vol:	204	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1259	0	93	0	0	0	0	39	0	0	130	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1325	0	98	0	0	0	0	41	0	0	137	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1325	0	98	0	0	0	0	41	0	0	137	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00
Final Vol:	1365	0	98	0	0	0	0	41	0	0	144	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.00
Final Sat:	3610	0	1615	0	0	0	0	1900	0	0	3800	0

Capacity Analysis Module:

Vol/Sat:	0.38	0.00	0.06	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.00
Crit Moves:	****						****				****	
Green Time:	85.4	0.0	85.4	0.0	0.0	0.0	0.0	8.6	0.0	0.0	8.6	0.0
Volume/Cap:	0.44	0.00	0.07	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.44	0.00
Delay/Veh:	1.2	0.0	0.7	0.0	0.0	0.0	0.0	27.8	0.0	0.0	28.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.2	0.0	0.7	0.0	0.0	0.0	0.0	27.8	0.0	0.0	28.7	0.0
DesignQueue:	12	0	1	0	0	0	0	2	0	0	7	0

PHASING ANALYSIS

Intersection 1: E. Second / I-780 EB ramps

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT	
NB	0	348	126	NB	0	372	126	NB	0	404	126	NB	0	451	126	NB	0	492	126
SB	295	352	0	SB	327	388	0	SB	358	418	0	SB	389	450	0	SB	421	482	0
EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0
WB	190	0	305	WB	196	0	340	WB	201	0	419	WB	206	0	534	WB	212	0	614

Intersection 2: E. Second / I-780 WB ramps

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT	
NB	192	402	0	NB	203	459	0	NB	215	566	0	NB	226	725	0	NB	238	863	0
SB	0	473	216	SB	0	500	265	SB	0	521	318	SB	0	544	382	SB	0	567	440
EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0
WB	155	0	198	WB	206	0	242	WB	258	0	287	WB	310	0	332	WB	362	0	377

Intersection 3: E. Second / Rose

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT	
NB	119	319	0	NB	138	386	0	NB	157	503	0	NB	176	673	0	NB	195	821	0
SB	0	281	104	SB	0	311	144	SB	0	337	170	SB	0	377	203	SB	0	411	234
EB	242	0	381	EB	313	0	403	EB	397	0	426	EB	510	0	449	EB	612	0	471
WB	0	0	0	WB	0	0	0	WB	0	0	0	WB	0	0	0	WB	0	0	0

Intersection 4: Industrial / E. Second

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT	
NB	35	3	5	NB	68	23	6	NB	101	115	6	NB	134	254	7	NB	167	373	7
SB	53	9	12	SB	55	14	17	SB	65	37	41	SB	81	72	76	SB	94	101	106
EB	82	370	95	EB	103	450	179	EB	196	520	263	EB	337	624	347	EB	459	714	431
WB	5	361	162	WB	5	430	207	WB	5	463	284	WB	5	504	382	WB	5	543	472

Intersection 5: E. Second / Lake Herman

Stage 1 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	142	8	220
SB	1	15	2
EB	3	101	141
WB	393	421	21

Stage 2 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	213	8	231
SB	1	15	2
EB	4	134	196
WB	408	682	26

Stage 3 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	213	8	255
SB	1	15	2
EB	5	140	201
WB	469	922	30

Stage 4 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	261	8	286
SB	1	15	2
EB	6	147	208
WB	561	1,175	35

Stage 5 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	285	8	313
SB	1	15	3
EB	7	155	215
WB	643	1,421	39

Intersection 6: I-680 SB ramps / Lake Herman

Stage 1 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	53	0	450
EB	0	227	99
WB	61	240	0

Stage 2 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	63	0	504
EB	0	253	120
WB	61	316	0

Stage 3 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	72	0	598
EB	0	281	123
WB	61	378	0

Stage 4 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	82	0	728
EB	0	318	127
WB	61	448	0

Stage 5 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	0	0	0
SB	92	0	843
EB	0	351	130
WB	61	514	0

Intersection 7: Goodyear - I-680 NB ramp / Lake Herman

Stage 1 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	237	109	95
SB	5	3	14
EB	29	107	123
WB	42	89	2

Stage 2 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	320	154	124
SB	6	3	14
EB	29	118	145
WB	50	101	1

Stage 3 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	390	198	152
SB	7	3	14
EB	29	130	171
WB	59	112	1

Stage 4 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	467	243	181
SB	8	3	14
EB	29	142	204
WB	68	123	1

Stage 5 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	541	287	209
SB	9	3	14
EB	29	153	235
WB	76	135	0

Intersection 8: Park / Industrial

Stage 1 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	164	124	244
SB	19	84	5
EB	4	25	121
WB	210	82	139

Stage 2 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	243	166	339
SB	23	114	5
EB	4	25	126
WB	284	106	240

Stage 3 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	393	236	434
SB	27	150	5
EB	4	25	149
WB	358	129	341

Stage 4 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	590	330	529
SB	31	190	5
EB	4	25	184
WB	433	153	442

Stage 5 Total AM			
Turning Movement Volumes			
	LT	TH	RT
NB	768	414	625
SB	35	229	5
EB	4	25	213
WB	507	176	543

Intersection 9: I-680 SB Off / Industrial

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
SB	57	0	212	SB	57	0	248	SB	57	0	285	SB	57	0	321	SB	57	0	358
EB	0	251	0	EB	0	320	0	EB	0	387	0	EB	0	451	0	EB	0	520	0
WB	0	95	0	WB	0	133	0	WB	0	171	0	WB	0	209	0	WB	0	247	0

Intersection 10: I-680 NB On / Industrial

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0
EB	17	506	0	EB	17	788	0	EB	18	1,071	0	EB	18	1,354	0	EB	19	1,636	0
WB	0	117	16	WB	0	163	16	WB	0	210	16	WB	0	257	16	WB	0	303	16

Intersection 11: Park / Bayshore

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	20	27	16		32	35	16		41	44	16		55	56	16		66	67	16
SB	251	88	176	SB	336	104	286	SB	444	119	397	SB	569	134	508	SB	687	149	618
EB	11	15	11	EB	13	22	18	EB	14	29	24	EB	16	35	31	EB	17	42	37
WB	75	23	527	WB	108	25	750	WB	142	26	1,072	WB	176	27	1,460	WB	210	29	1,822

Intersection 12: I-680 SB On / Bayshore

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0
EB	0	54	216	EB	0	54	290	EB	0	54	388	EB	0	54	504	EB	0	54	612
WB	33	608	0	WB	35	857	0	WB	36	1,204	0	WB	38	1,617	0	WB	40	2,004	0

Intersection 13: I-680 NB Off / Bayshore

Stage 1 Total AM Turning Movement Volumes				Stage 2 Total AM Turning Movement Volumes				Stage 3 Total AM Turning Movement Volumes				Stage 4 Total AM Turning Movement Volumes				Stage 5 Total AM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	662	0	175		994	0	249		1,425	0	324		1,922	0	398		2,393	0	473
SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0
EB	0	78	0	EB	0	78	0	EB	0	78	0	EB	0	78	0	EB	0	78	0
WB	0	46	0	WB	0	46	0	WB	0	46	0	WB	0	46	0	WB	0	46	0

Intersection 1: E. Second / I-780 EB ramps

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	0	603	141		0	678	141		0	691	141		0	708	141		0	725	141
SB	141	640	0	SB	157	748	0	SB	173	814	0	SB	189	896	0	SB	205	973	0
EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0
WB	151	0	219	WB	155	0	291	WB	160	0	324	WB	164	0	368	WB	168	0	406

Intersection 2: E. Second / I-780 WB ramps

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	255	533	0		271	677	0		286	723	0		301	782	0		317	835	0
SB	0	564	261	SB	0	646	367	SB	0	687	482	SB	0	743	639	SB	0	794	780
EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0	EB	0	0	0
WB	249	0	176	WB	333	0	221	WB	416	0	266	WB	499	0	311	WB	583	0	356

Intersection 3: E. Second / Rose

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	326	346	0		383	486	0		439	527	0		496	583	0		553	632	0
SB	0	433	310	SB	0	579	491	SB	0	694	597	SB	0	868	733	SB	0	1,018	856
EB	192	0	148	EB	333	0	163	EB	360	0	177	EB	494	0	191	EB	425	0	206
WB	0	0	0	WB	0	0	0	WB	0	0	0	WB	0	0	0	WB	0	0	0

Intersection 4: Industrial / E. Second

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
	105	14	21		204	20	22		303	44	24		402	82	25		501	115	27
SB	111	17	88	SB	121	39	111	SB	165	139	212	SB	232	290	366	SB	290	420	499
EB	34	580	17	EB	40	838	33	EB	65	862	48	EB	103	896	63	EB	137	926	78
WB	3	420	116	WB	3	693	145	WB	3	780	183	WB	3	903	225	WB	3	1,013	267

Intersection 5: E. Second / Lake Herman

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
SB	305	87	482	SB	589	87	510	SB	610	87	589	SB	633	87	703	SB	655	87	802
EB	20	20	9	EB	20	20	10	EB	20	20	10	EB	20	20	11	EB	20	20	11
WB	7	168	284	WB	10	323	555	WB	12	343	577	WB	15	371	611	WB	17	397	640
	279	268	69		286	495	83		306	576	97		334	660	112		360	743	126

Intersection 6: I-680 SB ramps / Lake Herman

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0	SB	0	0	0
EB	17	0	224	EB	20	0	292	EB	24	0	325	EB	27	0	367	EB	30	0	405
WB	0	443	230	WB	0	528	333	WB	0	619	344	WB	0	749	362	WB	0	864	377
	120	382	0		120	556	0		120	632	0		120	710	0		120	788	0

Intersection 7: Goodyear - I-680 NB ramp / Lake Herman

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
SB	302	5	31	SB	464	7	41	SB	528	9	50	SB	595	11	59	SB	661	13	69
EB	1	3	60	EB	1	3	60	EB	2	3	60	EB	2	3	60	EB	2	3	60
WB	27	45	391	WB	27	50	479	WB	27	55	572	WB	27	60	705	WB	27	65	822
	126	152	0		153	172	0		179	191	0		205	210	0		232	230	0

Intersection 8: Park / Industrial

Stage 1 Total PM Turning Movement Volumes				Stage 2 Total PM Turning Movement Volumes				Stage 3 Total PM Turning Movement Volumes				Stage 4 Total PM Turning Movement Volumes				Stage 5 Total PM Turning Movement Volumes			
NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT	NB	LT	TH	RT
SB	172	104	157	SB	239	148	219	SB	324	179	280	SB	423	217	341	SB	517	252	402
EB	28	183	22	EB	34	267	22	EB	40	367	22	EB	46	491	22	EB	52	606	22
WB	36	98	135	WB	36	98	157	WB	36	98	257	WB	36	98	408	WB	36	98	538
	198	40	44		268	52	76		337	63	108		407	75	140		477	86	171

Intersection 9: I-680 SB Off / IndustrialStage 1 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	11	0	46
EB	0	295	0
WB	0	223	0

Stage 2 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	11	0	54
EB	0	373	0
WB	0	312	0

Stage 3 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	11	0	62
EB	0	451	0
WB	0	402	0

Stage 4 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	11	0	70
EB	0	529	0
WB	0	491	0

Stage 5 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	11	0	78
EB	0	607	0
WB	0	580	0

Intersection 10: I-680 NB On / IndustrialStage 1 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	177	125	0
WB	0	220	66

Stage 2 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	184	194	0
WB	0	308	66

Stage 3 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	190	264	0
WB	0	396	66

Stage 4 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	196	334	0
WB	0	484	66

Stage 5 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	202	404	0
WB	0	572	66

Intersection 11: Park / BayshoreStage 1 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	7	115	39
SB	404	53	11
EB	31	30	11
WB	69	16	301

Stage 2 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	11	144	39
SB	526	68	62
EB	35	43	18
WB	101	17	419

Stage 3 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	14	153	39
SB	647	213	76
EB	38	57	24
WB	132	18	565

Stage 4 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	18	164	39
SB	769	430	95
EB	42	71	31
WB	163	19	729

Stage 5 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	22	174	39
SB	890	618	113
EB	46	85	37
WB	194	20	885

Intersection 12: I-680 SB On / BayshoreStage 1 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	39	434
WB	64	383	0

Stage 2 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	39	599
WB	67	529	0

Stage 3 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	39	872
WB	71	702	0

Stage 4 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	39	1,218
WB	74	893	0

Stage 5 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	0	0	0
SB	0	0	0
EB	0	39	1,534
WB	78	1,078	0

Intersection 13: I-680 NB Off / BayshoreStage 1 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	321	0	30
SB	0	0	0
EB	0	39	0
WB	0	130	0

Stage 2 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	476	0	42
SB	0	0	0
EB	0	39	0
WB	0	130	0

Stage 3 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	657	0	55
SB	0	0	0
EB	0	39	0
WB	0	130	0

Stage 4 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	857	0	68
SB	0	0	0
EB	0	39	0
WB	0	130	0

Stage 5 Total PM
Turning Movement Volumes

	LT	TH	RT
NB	1,050	0	80
SB	0	0	0
EB	0	39	0
WB	0	130	0

APPENDIX E

AIR QUALITY BACKGROUND INFORMATION

■ ■ ■

AIR QUALITY MODEL PRINTOUTS

REGIONAL EMISSIONS

(URBEMIS7G OUTPUTS)

PROPOSED PROJECT

URBEMIS 7G: Version 3.2

File Name: BENICIA.URB
 Project Name: Benicia Business Park
 Project Location: San Francisco Bay Area

SUMMARY REPORT
 (Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	PM10
TOTALS (ppd, unmitigated)	0.40	5.54	2.22	0.01
TOTALS (ppd, mitigated)	0.09	1.28	2.22	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	PM10
TOTALS (ppd, unmitigated)	1025.68	1151.13	8920.30	317.36
TOTALS (ppd, mitigated)	1025.68	1151.13	8920.30	317.36

URBEMIS 7G: Version 3.2

File Name: BENICIA.URB
 Project Name: Benicia Business Park
 Project Location: San Francisco Bay Area

DETAILED REPORT
 (Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)				
Source	ROG	NOx	CO	PM10
Natural Gas	0.40	5.54	2.22	0.01
Wood Stoves	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00
Landscaping - No winter emissions				
Consumer Prdcts	0.00			
TOTALS (ppd, unmitigated)	0.40	5.54	2.22	0.01

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Mitigated)				
Source	ROG	NOx	CO	PM10
Natural Gas	0.09	1.28	2.22	0.00
Wood Stoves	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00
Landscaping - No Winter Emissions				
Consumer Prdcts	0.00			
TOTALS (ppd, mitigated)	0.09	1.28	2.22	0.00

Area Source Mitigation Measures

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2000 Temperature (F): 40 Season: Winter

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Retail	40.00 trips / 1000 sq. ft.	490.00	19,600.00
Industrial	5.00 trips / 1000 sq. ft.	4981.87	24,909.36

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	75.00	1.16	98.58	0.26
Light Duty Trucks	10.00	0.13	99.54	0.33
Medium Duty Trucks	3.00	1.44	98.56	
Lite-Heavy Duty Trucks	1.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	1.00	19.56	40.00	40.44
Heavy-Heavy Trucks	5.00			100.00
Urban Buses	2.00			100.00
Motorcycles	3.00		100.00 % all fuels	

Travel Conditions

	Residential			Commercial		
	Home- Work	Home- Shop	Home- Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	4.6	6.1	11.8	5.0	5.0
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip Speeds (mph)	30	30	30	30	30	30
% of Trips - Residential	27.3	21.2	51.5			
% of Trips - Commercial (by land use)						
Retail				2.0	1.0	97.0
Industrial				48.0	24.0	28.0

UNMITIGATED EMISSIONS

	ROG	NOx	CO	PM10
Retail	302.35	307.82	2766.98	77.82
Industrial	723.33	843.32	6153.32	239.54
TOTAL EMISSIONS (lbs/day)	1025.68	1151.13	8920.30	317.36

Includes correction for passby trips.

Does not include double counting adjustment for internal trips.

MITIGATED EMISSIONS

	ROG	NOx	CO	PM10
Retail	302.35	307.82	2766.98	77.82
Industrial	723.33	843.32	6153.32	239.54
TOTAL EMISSIONS (lbs/day)	1025.68	1151.13	8920.30	317.36

Includes correction for passby trips.

Does not include double counting adjustment for internal trips.

ENVIRONMENTAL FACTORS APPLICABLE TO THE PROJECT

Pedestrian Environment

0 Side Walks/Paths: No Sidewalks
0 Street Trees Provide Shade: No Coverage
0 Pedestrian Circulation Access: No Destinations
0 Visually Interesting Uses: No Uses Within Walking Distance
0 Street System Enhances Safety: No Streets
0 Pedestrian Safety from Crime: No Degree of Safety
0 Visually Interesting Walking Routes: No Visual Interest

0.0 <- Pedestrian Environmental Credit

0.0 /19 = 0.00 <- Pedestrian Effectiveness Factor

Transit Service

0 Transit Service: Dial-A-Ride or No Transit Service

0.0 <- Transit Effectiveness

0.0 <- Pedestrian Factor

0.0 <-Total

0.0 /110 = 0.00 <-Transit Effectiveness Factor

Bicycle Environment

0 Interconnected Bikeways: No Bikeway Coverage
0 Bike Routes Provide Paved Shoulders: No Routes
0.0 Safe Vehicle Speed Limits: No Routes Provided
0 Safe School Routes: No Schools
0 Uses w/in Cycling Distance: No Uses w/in Cycling Distance
0 Bike Parking Ordinance: No Ordinance or Unenforceable

0.0 <- Bike Environmental Credit

0.0 /20 = 0.00 <- Bike Effectiveness Factor

MITIGATION MEASURES SELECTED FOR THIS PROJECT
(All mitigation measures are printed, even if
the selected land uses do not constitute a mixed use.)

Transit Infrastructure Measures

% Trips Reduced	Measure
15	Credit for Existing or Planned Community Transit Service
15	<- Totals

Pedestrian Enhancing Infrastructure Measures (Residential)

% Trips Reduced	Measure
2	Credit for Surrounding Pedestrian Environment
2	<- Totals

Pedestrian Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
2	Credit for Surrounding Pedestrian Environment
2	<- Totals

Bicycle Enhancing Infratructure Measures (Residential)

% Trips Reduced	Measure
7	Credit for Surrounding Bicycle Environment
7	<- Totals

Bike Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
5	Credit for Surrounding Area Bike Environment
5	<- Totals

Operational Measures (Applying to Commute Trips)

% Trips Reduced	Measure
0	<- Totals

Operational Measures (Applying to Employee Non-Commute Trips)

% Trips Reduced	Measure
0	<- Totals

Operational Measures (Applying to Customer Trips)

% Trips Reduced	Measure
0	<- Totals

Measures Reducing VMT (Non-Residential)

VMT Reduced	Measure
0	<- Totals

Measures Reducing VMT (Residential)

VMT Reduced	Measure
0	<- Totals

Total Percentage Trip Reduction

with Environmental Factors and Mitigation Measures

Travel Mode	Home-Work Trips	Home-Shop Trips	Home-Other Trips
Pedestrian	0.00	0.00	0.00
Transit	0.00	0.00	0.00
Bicycle	0.00	0.00	0.00
Totals	0.00	0.00	0.00
Travel Mode	Work Trips	Employee Trips	Customer Trips
Pedestrian	0.00	0.00	0.00
Transit	0.00	0.00	0.00
Bicycle	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	0.00	0.00	0.00

Changes made to the default values

The user has turned on the area source emissions default switch.

URBEMIS 7G: Version 3.2

File Name: BENICIA.URB
 Project Name: Benicia Business Park
 Project Location: San Francisco Bay Area

SUMMARY REPORT
 (Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	PM10
TOTALS (ppd, unmitigated)	0.67	5.55	4.00	0.02
TOTALS (ppd, mitigated)	0.36	1.29	4.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	PM10
TOTALS (ppd, unmitigated)	678.04	997.93	4560.26	317.36
TOTALS (ppd, mitigated)	678.04	997.93	4560.26	317.36

URBEMIS 7G: Version 3.2

File Name: BENICIA.URB
 Project Name: Benicia Business Park
 Project Location: San Francisco Bay Area

DETAILED REPORT
 (Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	PM10
Natural Gas	0.40	5.54	2.22	0.01
Wood Stoves - No summer emissions				
Fireplaces - No summer emissions				
Landscaping	0.27	0.01	1.78	0.01
Consumer Prdcts	0.00			
TOTALS (ppd, unmitigated)	0.67	5.55	4.00	0.02

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Mitigated)

Source	ROG	NOx	CO	PM10
Natural Gas	0.09	1.28	2.22	0.00
Wood Stoves - No summer emissions				
Fireplaces - No summer emissions				
Landscaping	0.27	0.01	1.78	0.01
Consumer Prdcts	0.00			
TOTALS (ppd, mitigated)	0.36	1.29	4.00	0.01

Area Source Mitigation Measures

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2000 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Retail	40.00 trips / 1000 sq. ft.	490.00	19,600.00
Industrial	5.00 trips / 1000 sq. ft.	4981.87	24,909.36

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	75.00	1.16	98.58	0.26
Light Duty Trucks	10.00	0.13	99.54	0.33
Medium Duty Trucks	3.00	1.44	98.56	
Lite-Heavy Duty Trucks	1.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	1.00	19.56	40.00	40.44
Heavy-Heavy Trucks	5.00			100.00
Urban Buses	2.00			100.00
Motorcycles	3.00	100.00 % all fuels		

Travel Conditions

	Residential			Commercial		
	Home- Work	Home- Shop	Home- Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	4.6	6.1	11.8	5.0	5.0
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip Speeds (mph)	30	30	30	30	30	30
% of Trips - Residential	27.3	21.2	51.5			
% of Trips - Commercial (by land use)						
Retail				2.0	1.0	97.0
Industrial				48.0	24.0	28.0

UNMITIGATED EMISSIONS

	ROG	NOx	CO	PM10
Retail	174.92	263.65	1268.83	77.82
Industrial	503.13	734.28	3291.43	239.54
TOTAL EMISSIONS (lbs/day)	678.04	997.93	4560.26	317.36

Includes correction for passby trips.

Does not include double counting adjustment for internal trips.

MITIGATED EMISSIONS

	ROG	NOx	CO	PM10
Retail	174.92	263.65	1268.83	77.82
Industrial	503.13	734.28	3291.43	239.54
TOTAL EMISSIONS (lbs/day)	678.04	997.93	4560.26	317.36

Includes correction for passby trips.

Does not include double counting adjustment for internal trips.

ENVIRONMENTAL FACTORS APPLICABLE TO THE PROJECT

Pedestrian Environment

0 Side Walks/Paths: No Sidewalks
0 Street Trees Provide Shade: No Coverage
0 Pedestrian Circulation Access: No Destinations
0 Visually Interesting Uses: No Uses Within Walking Distance
0 Street System Enhances Safety: No Streets
0 Pedestrian Safety from Crime: No Degree of Safety
0 Visually Interesting Walking Routes: No Visual Interest

0.0 <- Pedestrian Environmental Credit

0.0 /19 = 0.00 <- Pedestrian Effectiveness Factor

Transit Service

0 Transit Service: Dial-A-Ride or No Transit Service

0.0 <- Transit Effectiveness

0.0 <- Pedestrian Factor

0.0 <-Total

0.0 /110 = 0.00 <-Transit Effectiveness Factor

Bicycle Environment

0 Interconnected Bikeways: No Bikeway Coverage
0 Bike Routes Provide Paved Shoulders: No Routes
0.0 Safe Vehicle Speed Limits: No Routes Provided
0 Safe School Routes: No Schools
0 Uses w/in Cycling Distance: No Uses w/in Cycling Distance
0 Bike Parking Ordinance: No Ordinance or Unenforceable

0.0 <- Bike Environmental Credit

0.0 /20 = 0.00 <- Bike Effectiveness Factor

MITIGATION MEASURES SELECTED FOR THIS PROJECT
(All mitigation measures are printed, even if
the selected land uses do not constitute a mixed use.)

Transit Infrastructure Measures

% Trips Reduced	Measure
15	Credit for Existing or Planned Community Transit Service
15	<- Totals

Pedestrian Enhancing Infrastructure Measures (Residential)

% Trips Reduced	Measure
2	Credit for Surrounding Pedestrian Environment
2	<- Totals

Pedestrian Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
2	Credit for Surrounding Pedestrian Environment
2	<- Totals

Bicycle Enhancing Infrastructure Measures (Residential)

% Trips Reduced	Measure
7	Credit for Surrounding Bicycle Environment
7	<- Totals

Bike Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
5	Credit for Surrounding Area Bike Environment
5	<- Totals

Operational Measures (Applying to Commute Trips)

% Trips Reduced	Measure
0	<- Totals

Operational Measures (Applying to Employee Non-Commute Trips)

% Trips Reduced	Measure
0	<- Totals

Operational Measures (Applying to Customer Trips)

% Trips Reduced	Measure
0	<- Totals

Measures Reducing VMT (Non-Residential)

VMT Reduced	Measure
0	<- Totals

Measures Reducing VMT (Residential)

VMT Reduced	Measure
0	<- Totals

Total Percentage Trip Reduction

with Environmental Factors and Mitigation Measures

Travel Mode	Home-Work Trips	Home-Shop Trips	Home-Other Trips
Pedestrian	0.00	0.00	0.00
Transit	0.00	0.00	0.00
Bicycle	0.00	0.00	0.00
Totals	0.00	0.00	0.00
Travel Mode	Work Trips	Employee Trips	Customer Trips
Pedestrian	0.00	0.00	0.00
Transit	0.00	0.00	0.00
Bicycle	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	0.00	0.00	0.00

Changes made to the default values

The user has turned on the area source emissions default switch.

AIR QUALITY MODEL PRINTOUTS

CALINE4 CO HOT SPOT ANALYSIS

YEAR 2010 WITHOUT PROJECT

MODEL RESULTS FOR FILE a:cibnp1

		* PRED	* WIND	*	COCN/LINK						
		* CONC	* BRG	*	(PPM)						
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	
		*	*	*							
RECPT	1	*	0.1	* 193	*	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	2	*	0.1	* 195	*	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	3	*	0.1	* 197	*	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	4	*	0.1	* 198	*	0.0	0.0	0.0	0.0	0.0	0.0

MODEL RESULTS FOR FILE a:cibnp2

		* PRED	* WIND	*	COCN/LINK							
		* CONC	* BRG	*	(PPM)							
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F		
		*	*	*								
RECPT	1	*	0.1	*	258	*	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	2	*	0.1	*	256	*	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	3	*	0.1	*	256	*	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	4	*	0.1	*	254	*	0.0	0.0	0.0	0.1	0.0	0.0

MODEL RESULTS FOR FILE a:cibnp3

		* PRED	* WIND	*	COCN/LINK							
		* CONC	* BRG	*	(PPM)							
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F		
		*	*	*								
RECPT	1	*	0.1	*	260	*	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	2	*	0.1	*	258	*	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	3	*	0.1	*	256	*	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	4	*	0.1	*	255	*	0.0	0.0	0.0	0.0	0.0	0.0

MODEL RESULTS FOR FILE a:cibnp4

		* PRED	*WIND	*	COCN/LINK								
		* CONC	* BRG	*	(PPM)								
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	
		*	*	*									
RECPT	1	*	0.1	* 192	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	2	*	0.1	* 193	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	3	*	0.1	* 194	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	4	*	0.1	* 196	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MODEL RESULTS FOR FILE a:cibnp5

		* PRED	* WIND	COCN/LINK									
		* CONC	* BRG	(PPM)									
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	
-----*													
RECPT	1	*	0.1	* 194	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	2	*	0.1	* 196	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	3	*	0.1	* 197	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	4	*	0.1	* 198	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MODEL RESULTS FOR FILE a:cibnp6

		* PRED	* WIND	COCN/LINK						
		* CONC	* BRG	(PPM)						
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F
		*	*	*						
RECPT	1	*	0.1	* 257 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	2	*	0.1	* 256 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	3	*	0.1	* 254 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	4	*	0.1	* 254 *	0.0	0.0	0.0	0.1	0.0	0.0

MODEL RESULTS FOR FILE a:cibnp7

		* PRED	*WIND	COCN/LINK									
		* CONC	* BRG	(PPM)									
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	

RECPT	1	*	0.3	* 193	*	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
RECPT	2	*	0.2	* 195	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	3	*	0.2	* 196	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	4	*	0.2	* 197	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

MODEL RESULTS FOR FILE a:cibnp8

		* PRED	*WIND	COCN/LINK									
		* CONC	* BRG	(PPM)									
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	
-----		*	*	*	-----								
RECPT	1	*	0.2	* 193	*	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	2	*	0.2	* 194	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	3	*	0.2	* 196	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	4	*	0.1	* 198	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

MODEL RESULTS FOR FILE a:cibnp9

RECEPTOR		* PRED	* WIND	COCN/LINK				
		* CONC	* BRG	(PPM)				
		* (PPM)	* (DEG)	A	B	C	D	E
RECPT	1	* 0.2	* 259	* 0.1	0.0	0.0	0.1	0.0
RECPT	2	* 0.2	* 258	* 0.1	0.0	0.0	0.1	0.0
RECPT	3	* 0.1	* 256	* 0.1	0.0	0.0	0.1	0.0
RECPT	4	* 0.1	* 254	* 0.0	0.0	0.0	0.1	0.0

MODEL RESULTS FOR FILE a:cibnp10

RECEPTOR		* PRED	* WIND	COCN/LINK				
		* CONC	* BRG	(PPM)				
		* (PPM)	* (DEG)	A	B	C	D	E
RECPT	1	* 0.2	* 259	* 0.0	0.0	0.0	0.0	0.1
RECPT	2	* 0.1	* 257	* 0.0	0.0	0.0	0.0	0.1
RECPT	3	* 0.1	* 255	* 0.0	0.0	0.0	0.0	0.1
RECPT	4	* 0.1	* 255	* 0.0	0.0	0.0	0.0	0.1

MODEL RESULTS FOR FILE a:cibnp11

RECEPTOR		* PRED	* WIND	COCN/LINK							
		* CONC	* BRG	(PPM)							
		* (PPM)	* (DEG)	A	B	C	D	E	F	G	H
RECPT	1	* 0.1	* 195	* 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	2	* 0.1	* 197	* 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	3	* 0.1	* 198	* 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	4	* 0.1	* 199	* 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MODEL RESULTS FOR FILE a:cibnp12

RECEPTOR		* PRED	* WIND	COCN/LINK				
		* CONC	* BRG	(PPM)				
		* (PPM)	* (DEG)	A	B	C	D	E
RECPT	1	* 0.2	* 192	* 0.0	0.0	0.0	0.0	0.2
RECPT	2	* 0.2	* 193	* 0.0	0.0	0.0	0.0	0.1
RECPT	3	* 0.1	* 196	* 0.0	0.0	0.0	0.0	0.1
RECPT	4	* 0.1	* 253	* 0.0	0.0	0.0	0.1	0.0

MODEL RESULTS FOR FILE a:cibnp13

		* PRED	* WIND	*	COCN/LINK					
		* CONC	* BRG	*	(PPM)					
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	
		*	*	*	-----					
RECPT	1	* 0.1	* 260	*	0.0	0.0	0.0	0.0	0.1	
RECPT	2	* 0.1	* 258	*	0.0	0.0	0.0	0.0	0.1	
RECPT	3	* 0.1	* 256	*	0.0	0.0	0.0	0.0	0.1	
RECPT	4	* 0.1	* 255	*	0.0	0.0	0.0	0.0	0.1	

REPORT FOR FILE : CIBNP

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*			EF	H	W
DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. E. 2ND NBA	*	3	-200	3	0	*	AG	235	1.6	0.0	12.9
B. E. 2ND NBD	*	3	0	3	200	*	AG	398	1.6	0.0	9.6
C. I-780EB EBD	*	0	-3	200	-3	*	AG	362	1.8	0.0	6.3
D. I-780EB WBA	*	200	3	0	3	*	AG	203	1.8	0.0	9.6
E. E. 2ND SBA	*	-3	200	-3	0	*	AG	320	1.6	0.0	12.9
F. E. 2ND SBD	*	-3	0	-3	-200	*	AG	456	1.6	0.0	9.6

LINK	*	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	L	R	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
	*	(M)	(M)										
A.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	18	15	1.8
RECEPTOR	2	23	20	1.8
RECEPTOR	3	28	25	1.8
RECEPTOR	4	33	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M)				*	TYPE	VPH	EF (G/MI)	H (M)	W (M)
	*	X1	Y1	X2	Y2	*					
A. E. 2ND NBA		3	-200	3	0		AG	268	1.6	0.0	12.9
B. E. 2ND NBD		3	0	3	200		AG	582	1.6	0.0	8.0
C. I-780WB WBA		200	3	0	3		AG	361	1.8	0.0	12.9
D. I-780WB WBD		0	3	-200	3		AG	721	1.8	0.0	6.3
E. E. 2ND SBA		-3	200	-3	0		AG	221	1.6	0.0	16.2
F. E. 2ND SBD		-3	0	-3	-200		AG	587	1.6	0.0	9.6

LINK	*	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
	*	L (M)	R (M)	(M)	(SEC)	(SEC)	(MPH)						
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	18	18	1.8
RECEPTOR	2	23	23	1.8
RECEPTOR	3	28	28	1.8
RECEPTOR	4	33	33	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. E. 2ND	NBA	3	-200	3	0	AG	225	1.6	0.0	16.2
B. E. 2ND	NBD	3	0	3	200	AG	146	1.6	0.0	9.6
C. ROSE	EBA	-200	-3	0	-3	AG	55	1.6	0.0	16.2
D. ROSE	WBD	0	3	-200	3	AG	367	1.6	0.0	9.6
E. E. 2ND	SBA	-3	200	-3	0	AG	167	1.6	0.0	19.5
F. E. 2ND	SBD	-3	0	-3	-200	AG	100	1.6	0.0	16.2

LINK	MIXW	L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR 1	1	22	15	1.8
RECEPTOR 2	2	27	22	1.8
RECEPTOR 3	3	32	27	1.8
RECEPTOR 4	4	37	32	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	E. 2ND NBA	3	-200	3	0	AG	167	1.6	0.0	12.9
B.	E. 2ND NBD	3	0	3	200	AG	341	1.6	0.0	8.0
C.	INDUSTR EBA	-200	-3	0	-3	AG	43	1.6	0.0	19.5
D.	INDUSTR EBD	0	-3	200	-3	AG	57	1.6	0.0	9.6
E.	INDUSTR WBA	200	3	0	3	AG	128	1.6	0.0	19.5
F.	INDUSTR WBD	0	3	-200	3	AG	85	1.6	0.0	14.6
G.	E. 2ND SBA	-3	200	-3	0	AG	97	1.6	0.0	19.5
H.	E. 2ND SBD	-3	0	-3	-200	AG	307	1.6	0.0	12.9

LINK	* L (M)	* R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
1		18	25	1.8
2		23	30	1.8
3		28	35	1.8
4		33	40	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	E. 2ND NBA	3	-200	3	0	AG	188	1.6	0.0	16.2
B.	E. 2ND NBD	3	0	3	200	AG	247	1.6	0.0	6.3
C.	LHERMAN EBA	-200	-3	0	-3	AG	14	1.6	0.0	16.2
D.	LHERMAN EBD	0	-3	200	-3	AG	293	1.6	0.0	9.6
E.	LHERMAN WBA	200	3	0	3	AG	232	1.6	0.0	16.2
F.	LHERMAN WBD	0	3	-200	3	AG	415	1.6	0.0	8.0
G.	E. 2ND SBA	-3	200	-3	0	AG	26	1.6	0.0	9.6
H.	E. 2ND SBD	-3	0	-3	-200	AG	664	1.6	0.0	6.3

LINK	* L (M)	* R (M)	* STPL (M)	* DCLT (SEC)	* ACCT (SEC)	* SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR 1	1	22	22	1.8
RECEPTOR 2	2	27	27	1.8
RECEPTOR 3	3	32	32	1.8
RECEPTOR 4	4	37	37	1.8

REPORT FOR FILE : CIBNP6

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*		EF	H	W	
DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. LHERMAN EBA		-200	-3	0	-3		AG	204	1.6	0.0	12.9
B. LHERMAN EBD		0	-3	200	-3		AG	259	1.6	0.0	9.6
C. LHERMAN WBA		200	3	0	3		AG	254	1.6	0.0	12.9
D. LHERMAN WBD		0	3	-200	3		AG	887	1.6	0.0	6.3
E. I-680SB SBA		-3	200	-3	0		AG	69	1.8	0.0	16.2
F. I-680SB SBD		-3	0	-3	-200		AG	125	1.8	0.0	9.6

LINK	*	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	L	R	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
	*	(M)	(M)										
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	8	18	1.8
RECEPTOR	2	13	23	1.8
RECEPTOR	3	18	28	1.8
RECEPTOR	4	23	33	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	* DESCRIPTION	* X1	LINK COORDINATES (M)	* Y1	X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	I-680NB NBA	3	-200	3	0	AG	299	1.8	0.0	9.6	
B.	I-680NB NBD	3	0	3	200	AG	84	1.8	0.0	6.3	
C.	LHERMAN EBA	-200	-3	0	-3	AG	181	1.6	0.0	12.9	
D.	LHERMAN EBD	0	-3	200	-3	AG	150	1.6	0.0	6.3	
E.	LHERMAN WBA	200	3	0	3	AG	254	1.6	0.0	9.6	
F.	LHERMAN WBD	0	3	-200	3	AG	1628	1.6	0.0	6.3	
G.	I-680NB SBA	-3	200	-3	0	AG	65	1.8	0.0	6.3	
H.	I-680NB SBD	-3	0	-3	-200	AG	2076	1.8	0.0	6.3	

LINK	* L (M)	MIXW R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR 1		15	15	1.8
RECEPTOR 2		20	20	1.8
RECEPTOR 3		25	25	1.8
RECEPTOR 4		30	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	PARK NBA	3	-200	3	0	AG	374	1.6	0.0	12.9
B.	PARK NBD	3	0	3	200	AG	420	1.6	0.0	6.3
C.	INDUSTR EBA	-200	-3	0	-3	AG	90	1.6	0.0	12.9
D.	INDUSTR EBD	0	-3	200	-3	AG	620	1.6	0.0	6.3
E.	INDUSTR WBA	200	3	0	3	AG	283	1.6	0.0	12.9
F.	INDUSTR WBD	0	3	-200	3	AG	1196	1.6	0.0	6.3
G.	PARK SBA	-3	200	-3	0	AG	167	1.6	0.0	12.9
H.	PARK SBD	-3	0	-3	-200	AG	1103	1.6	0.0	6.3

LINK	* L (M)	* R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR 1	1	18	18	1.8
RECEPTOR 2	2	23	23	1.8
RECEPTOR 3	3	28	28	1.8
RECEPTOR 4	4	33	33	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	* *	LINK COORDINATES (M)				* *	TYPE	VPH	EF (G/MI)	H (M)	W (M)
		X1	Y1	X2	Y2						
A. INDUSTR EBA		-200	-3	0	-3		AG	685	1.6	0.0	6.3
B. INDUSTR EBD		0	-3	200	-3		AG	696	1.6	0.0	6.3
C. INDUSTR WBA		200	3	0	3		AG	669	1.6	0.0	6.3
D. INDUSTR WBD		0	3	-200	3		AG	755	1.6	0.0	6.3
E. I-680SBFSBA		-3	200	-3	0		AG	49	1.8	0.0	9.6

LINK	* * * *		MIXW		STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
	L (M)	R (M)												
A.	0	0	0	0.0	0.0	0	0	0	0	0	0.0	0.0	0.0	
B.	0	0	0	0.0	0.0	0	0	0	0	0	0.0	0.0	0.0	
C.	0	0	0	0.0	0.0	0	0	0	0	0	0.0	0.0	0.0	
D.	0	0	0	0.0	0.0	0	0	0	0	0	0.0	0.0	0.0	
E.	0	0	0	0.0	0.0	0	0	0	0	0	0.0	0.0	0.0	

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	8	12	1.8
RECEPTOR	2	13	17	1.8
RECEPTOR	3	18	22	1.8
RECEPTOR	4	23	27	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	* VPH	* EF (G/MI)	* H (M)	* W (M)
A. I-680SBNBD	3	0	3	200	AG	275	1.8	0.0	6.3
B. INDUSTR EBA	-200	-3	0	-3	AG	341	1.6	0.0	9.6
C. INDUSTR EBD	0	-3	200	-3	AG	473	1.6	0.0	6.3
D. INDUSTR WBA	200	3	0	3	AG	363	1.6	0.0	9.6
E. INDUSTR WBD	0	3	-200	3	AG	660	1.6	0.0	6.3

LINK	* L (M)	* R (M)	* STPL (M)	* DCLT (SEC)	* ACCT (SEC)	* SPD (MPH)	* NCYC	* NDLA	* VPHO	* EFI (G/MIN)	* IDT1 (SEC)	* IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	12	15	1.8
RECEPTOR	2	17	20	1.8
RECEPTOR	3	22	25	1.8
RECEPTOR	4	27	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. PARK	NBA	3	-200	3	0	AG	39	1.8	0.0	19.5
B. PARK	NBD	3	0	3	200	AG	345	1.8	0.0	12.9
C. BAYSHOR	EBA	-200	-3	0	-3	AG	32	1.8	0.0	22.8
D. BAYSHOR	EBD	0	-3	200	-3	AG	328	1.8	0.0	14.6
E. BAYSHOR	WBA	200	3	0	3	AG	275	1.8	0.0	16.2
F. BAYSHOR	WBD	0	3	-200	3	AG	46	1.8	0.0	9.6
G. PARK	SBA	-3	200	-3	0	AG	279	1.8	0.0	16.2
H. PARK	SBD	-3	0	-3	-200	AG	327	1.8	0.0	6.3

LINK	MIXW	L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR	X	Y	Z
1	25	22	1.8
2	30	27	1.8
3	35	32	1.8
4	40	37	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*		EF	H	W	
DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. BAYSHOR EBA	*	-200	-3	0	-3	*	AG	571	1.8	0.0	9.6
B. BAYSHOR EBD	*	0	-3	200	-3	*	AG	39	1.8	0.0	6.3
C. BAYSHOR WBA	*	200	3	0	3	*	AG	578	1.8	0.0	9.6
D. BAYSHOR WBD	*	0	3	-200	3	*	AG	1074	1.8	0.0	6.3
E. I-680SB SBD	*	-3	0	-3	-200	*	AG	1183	1.8	0.0	6.3

* MIXW												
LINK	* L	R	STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	(M)	(M)	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	8	15	1.8
RECEPTOR	2	13	20	1.8
RECEPTOR	3	18	25	1.8
RECEPTOR	4	23	30	1.8

REPORT FOR FILE : CIBNP13

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M)				*		EF	H	W	
	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. I-680SBFNBA	*	3	-200	3	0	*	AG	383	1.8	0.0	12.9
B. BAYSHOR EBA	*	-200	-3	0	-3	*	AG	39	1.8	0.0	6.3
C. BAYSHOR EBD	*	0	-3	200	-3	*	AG	132	1.8	0.0	6.3
D. BAYSHOR WBA	*	200	3	0	3	*	AG	65	1.8	0.0	9.6
E. BAYSHOR WBD	*	0	3	-200	3	*	AG	593	1.8	0.0	9.6

LINK	*	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	L	R	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
	*	(M)	(M)										
A.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	18	15	1.8
RECEPTOR	2	23	20	1.8
RECEPTOR	3	28	25	1.8
RECEPTOR	4	33	30	1.8

AIR QUALITY MODEL PRINTOUTS

CALINE4 CO HOT SPOT ANALYSIS

YEAR 2010 WITH PROJECT

MODEL RESULTS FOR FILE a:cibwp1

RECEPTOR		* PRED	* WIND	COCN/LINK						
		* CONC	* BRG	(PPM)						
		* (PPM)	* (DEG)	*	A	B	C	D	E	F
RECPT	1	*	0.2	* 193 *	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	2	*	0.1	* 195 *	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	3	*	0.1	* 197 *	0.0	0.0	0.0	0.0	0.0	0.0
RECPT	4	*	0.1	* 198 *	0.0	0.0	0.0	0.0	0.0	0.0

MODEL RESULTS FOR FILE a:cibwp2

RECEPTOR		* PRED	* WIND	COCN/LINK						
		* CONC	* BRG	(PPM)						
		* (PPM)	* (DEG)	*	A	B	C	D	E	F
RECPT	1	*	0.2	* 257 *	0.0	0.1	0.0	0.1	0.0	0.0
RECPT	2	*	0.2	* 256 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	3	*	0.2	* 254 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	4	*	0.1	* 254 *	0.0	0.0	0.0	0.1	0.0	0.0

MODEL RESULTS FOR FILE a:cibwp3

RECEPTOR		* PRED	* WIND	COCN/LINK						
		* CONC	* BRG	(PPM)						
		* (PPM)	* (DEG)	*	A	B	C	D	E	F
RECPT	1	*	0.2	* 260 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	2	*	0.2	* 257 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	3	*	0.1	* 256 *	0.0	0.0	0.0	0.1	0.0	0.0
RECPT	4	*	0.1	* 254 *	0.0	0.0	0.0	0.1	0.0	0.0

MODEL RESULTS FOR FILE a:cibwp4

		* PRED	*WIND *	COCN/LINK									
		* CONC	* BRG *	(PPM)									
RECEPTOR		* (PPM)	* (DEG) *		A	B	C	D	E	F	G	H	
		*	*	*									
RECPT	1	*	0.2	* 219 *	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
RECPT	2	*	0.2	* 223 *	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
RECPT	3	*	0.1	* 225 *	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
RECPT	4	*	0.1	* 251 *	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	

MODEL RESULTS FOR FILE a:cibwp5

		* PRED	* WIND	COCN/LINK									
		* CONC	* BRG	(PPM)									
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	
		*	*	*									
RECPT	1	*	0.2	*	194	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	2	*	0.2	*	196	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	3	*	0.2	*	197	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	4	*	0.2	*	198	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1

MODEL RESULTS FOR FILE a:cibwp6

		* PRED	* WIND	COCN/LINK							
		* CONC	* BRG	(PPM)							
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	
		*	*	*							
RECPT	1	*	0.2	* 257 *	0.0	0.0	0.0	0.1	0.0	0.0	
RECPT	2	*	0.2	* 256 *	0.0	0.0	0.0	0.1	0.0	0.0	
RECPT	3	*	0.1	* 253 *	0.0	0.0	0.0	0.1	0.0	0.0	
RECPT	4	*	0.1	* 254 *	0.0	0.0	0.0	0.1	0.0	0.0	

MODEL RESULTS FOR FILE a:cibwp7

		* PRED	*WIND	COCN/LINK									
		* CONC	* BRG	(PPM)									
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	
		*	*	*									
RECPT	1	*	0.4	*	193	*	0.1	0.0	0.0	0.0	0.0	0.0	0.3
RECPT	2	*	0.3	*	195	*	0.1	0.0	0.0	0.0	0.0	0.0	0.3
RECPT	3	*	0.3	*	196	*	0.0	0.0	0.0	0.0	0.0	0.0	0.2
RECPT	4	*	0.3	*	197	*	0.0	0.0	0.0	0.0	0.0	0.0	0.2

MODEL RESULTS FOR FILE a:cibwp8

		* PRED	*WIND	COCN/LINK									
		* CONC	* BRG	(PPM)									
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	
		*	*	*									
RECPT	1	*	0.3	*	194	*	0.1	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	2	*	0.2	*	195	*	0.1	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	3	*	0.2	*	197	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1
RECPT	4	*	0.2	*	198	*	0.0	0.0	0.0	0.0	0.0	0.0	0.1

MODEL RESULTS FOR FILE a:cibwp9

		* PRED	* WIND *	COCN/LINK						
		* CONC	* BRG *	(PPM)						
RECEPTOR		* (PPM)	* (DEG) *	A	B	C	D	E		
		*	*	*						
RECPT	1	*	0.2	* 259 *	0.1	0.0	0.0	0.1	0.0	
RECPT	2	*	0.2	* 258 *	0.1	0.0	0.0	0.1	0.0	
RECPT	3	*	0.1	* 256 *	0.1	0.0	0.0	0.1	0.0	
RECPT	4	*	0.1	* 254 *	0.0	0.0	0.0	0.1	0.0	

MODEL RESULTS FOR FILE a:cibwp10

		* PRED	* WIND	*	COCN/LINK					
		* CONC	* BRG	*	(PPM)					
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	
		*	*	*	-----					
RECPT	1	* 0.2	* 259	*	0.0	0.0	0.0	0.0	0.1	
RECPT	2	* 0.1	* 257	*	0.0	0.0	0.0	0.0	0.1	
RECPT	3	* 0.1	* 255	*	0.0	0.0	0.0	0.0	0.1	
RECPT	4	* 0.1	* 255	*	0.0	0.0	0.0	0.0	0.1	

MODEL RESULTS FOR FILE a:cibwp11

		* PRED	*WIND *	COCN/LINK									
		* CONC	* BRG *	(PPM)									
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	F	G	H	
		*	*	*									
RECPT	1	*	0.1	* 195 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
RECPT	2	*	0.1	* 197 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
RECPT	3	*	0.1	* 198 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
RECPT	4	*	0.1	* 199 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

MODEL RESULTS FOR FILE a:cibwp12

		* PRED	* WIND *	COCN/LINK						
		* CONC	* BRG *	(PPM)						
RECEPTOR		* (PPM)	* (DEG)	*	A	B	C	D	E	
-----		*	*	*	-----	-----	-----	-----	-----	
RECPT	1	*	0.3	* 194 *	0.0	0.0	0.1	0.0	0.2	
RECPT	2	*	0.2	* 194 *	0.0	0.0	0.0	0.0	0.2	
RECPT	3	*	0.2	* 196 *	0.0	0.0	0.0	0.0	0.1	
RECPT	4	*	0.2	* 197 *	0.0	0.0	0.0	0.0	0.1	

MODEL RESULTS FOR FILE a:cibwpl3

RECEPTOR	* PRED		*WIND *		COCN/LINK				
	* CONC		* BRG *		(PPM)				
	* (PPM)		* (DEG) *		A	B	C	D	E
RECPT 1	*	0.1	*	260 *	0.0	0.0	0.0	0.0	0.1
RECPT 2	*	0.1	*	257 *	0.0	0.0	0.0	0.0	0.1
RECPT 3	*	0.1	*	256 *	0.0	0.0	0.0	0.0	0.1
RECPT 4	*	0.1	*	255 *	0.0	0.0	0.0	0.0	0.1

REPORT FOR FILE : CIBWP

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)	*	EF	H	W
DESCRIPTION	*	X1 Y1 X2 Y2	* TYPE	VPH	(G/MI)	(M)
A. E. 2ND NBA	*	3 -200 3 0	AG	295	1.6	12.9
B. E. 2ND NBD	*	3 0 3 200	AG	600	1.6	9.6
C. I-780EB EBD	*	0 -3 200 -3	AG	362	1.8	6.3
D. I-780EB WBA	*	200 3 0 3	AG	314	1.8	9.6
E. E. 2ND SBA	*	-3 200 -3 0	AG	429	1.6	12.9
F. E. 2ND SBD	*	-3 0 -3 -200	AG	619	1.6	9.6

LINK	*	MIXW	STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	L R	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
A.	*	0 0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	*	0 0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	*	0 0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	*	0 0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	*	0 0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	*	0 0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	18	15	1.8
RECEPTOR	2	23	20	1.8
RECEPTOR	3	28	25	1.8
RECEPTOR	4	33	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. E. 2ND NBA	3	-200	3	0	AG	411	1.6	0.0	12.9
B. E. 2ND NBD	3	0	3	200	AG	869	1.6	0.0	8.0
C. I-780WB WBA	200	3	0	3	AG	356	1.8	0.0	12.9
D. I-780WB WBD	0	3	-200	3	AG	1292	1.8	0.0	6.3
E. E. 2ND SBA	-3	200	-3	0	AG	455	1.6	0.0	16.2
F. E. 2ND SBD	-3	0	-3	-200	AG	764	1.6	0.0	9.6

LINK	* L (M)	* R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	18	18	1.8
RECEPTOR	2	23	23	1.8
RECEPTOR	3	28	28	1.8
RECEPTOR	4	33	33	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M)				*	TYPE	VPH	EF (G/MI)	H (M)	W (M)
	*	X1	Y1	X2	Y2	*					
A. E. 2ND NBA		3	-200	3	0		AG	326	1.6	0.0	16.2
B. E. 2ND NBD		3	0	3	200		AG	580	1.6	0.0	9.6
C. ROSE EBA		-200	-3	0	-3		AG	171	1.6	0.0	16.2
D. ROSE WBD		0	3	-200	3		AG	810	1.6	0.0	9.6
E. E. 2ND SBA		-3	200	-3	0		AG	446	1.6	0.0	19.5
F. E. 2ND SBD		-3	0	-3	-200		AG	361	1.6	0.0	16.2

LINK	*	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
	*	L (M)	R (M)	(M)	(SEC)	(SEC)	(MPH)						
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	22	15	1.8
RECEPTOR	2	27	22	1.8
RECEPTOR	3	32	27	1.8
RECEPTOR	4	37	32	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	E. 2ND NBA	3	-200	3	0	AG	415	1.6	0.0	12.9
B.	E. 2ND NBD	3	0	3	200	AG	1500	1.6	0.0	8.0
C.	INDUSTR EBA	-200	-3	0	-3	AG	272	1.6	0.0	19.5
D.	INDUSTR EBD	0	-3	200	-3	AG	129	1.6	0.0	9.6
E.	INDUSTR WBA	200	3	0	3	AG	330	1.6	0.0	19.5
F.	INDUSTR WBD	0	3	-200	3	AG	313	1.6	0.0	14.6
G.	E. 2ND SBA	-3	200	-3	0	AG	295	1.6	0.0	19.5
H.	E. 2ND SBD	-3	0	-3	-200	AG	710	1.6	0.0	12.9

LINK	MIXW L (M)	MIXW R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	18	25	1.8
RECEPTOR	2	23	30	1.8
RECEPTOR	3	28	35	1.8
RECEPTOR	4	33	40	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	E. 2ND NBA	3	-200	3	0	AG	425	1.6	0.0	16.2
B.	E. 2ND NBD	3	0	3	200	AG	500	1.6	0.0	6.3
C.	LHERMAN EBA	-200	-3	0	-3	AG	283	1.6	0.0	16.2
D.	LHERMAN EBD	0	-3	200	-3	AG	693	1.6	0.0	9.6
E.	LHERMAN WBA	200	3	0	3	AG	340	1.6	0.0	16.2
F.	LHERMAN WBD	0	3	-200	3	AG	1011	1.6	0.0	8.0
G.	E. 2ND SBA	-3	200	-3	0	AG	26	1.6	0.0	9.6
H.	E. 2ND SBD	-3	0	-3	-200	AG	1678	1.6	0.0	6.3

LINK	MIXW	L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	22	22	1.8
RECEPTOR	2	27	27	1.8
RECEPTOR	3	32	32	1.8
RECEPTOR	4	37	37	1.8

REPORT FOR FILE : CIBWP6

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*	EF	H	W	
DESCRIPTION	*	X1	Y1	X2	Y2	* TYPE	VPH	(G/MI)	(M)	(M)
A. LHERMAN EBA		-200	-3	0	-3	AG	471	1.6	0.0	12.9
B. LHERMAN EBD		0	-3	200	-3	AG	524	1.6	0.0	9.6
C. LHERMAN WBA		200	3	0	3	AG	329	1.6	0.0	12.9
D. LHERMAN WBD		0	3	-200	3	AG	1318	1.6	0.0	6.3
E. I-680SB SBA		-3	200	-3	0	AG	121	1.8	0.0	16.2
F. I-680SB SBD		-3	0	-3	-200	AG	259	1.8	0.0	9.6

LINK	*	MIXW	STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	L (M)	R (M)	(M)	(SEC)	(SEC)	(MPH)			(G/MIN)	(SEC)	(SEC)
A.		0	0	0	0.0	0.0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR 1		8	18	1.8
RECEPTOR 2		13	23	1.8
RECEPTOR 3		18	28	1.8
RECEPTOR 4		23	33	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	* *	LINK COORDINATES (M)				* *	TYPE	VPH	EF (G/MI)	H (M)	W (M)
		X1	Y1	X2	Y2						
A. I-680NB NBA		3	-200	3	0	AG	411	1.8	0.0	9.6	
B. I-680NB NBD		3	0	3	200	AG	84	1.8	0.0	6.3	
C. LHERMAN EBA		-200	-3	0	-3	AG	358	1.6	0.0	12.9	
D. LHERMAN EBD		0	-3	200	-3	AG	150	1.6	0.0	6.3	
E. LHERMAN WBA		200	3	0	3	AG	254	1.6	0.0	9.6	
F. LHERMAN WBD		0	3	-200	3	AG	2074	1.6	0.0	6.3	
G. I-680NB SBA		-3	200	-3	0	AG	65	1.8	0.0	6.3	
H. I-680NB SBD		-3	0	-3	-200	AG	3638	1.8	0.0	6.3	

LINK	* *	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
		L (M)	R (M)	(M)	(SEC)	(SEC)	(MPH)						
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	15	15	1.8
RECEPTOR	2	20	20	1.8
RECEPTOR	3	25	25	1.8
RECEPTOR	4	30	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	PARK NBA	3	-200	3	0	AG	460	1.6	0.0	12.9
B.	PARK NBD	3	0	3	200	AG	532	1.6	0.0	6.3
C.	INDUSTR EBA	-200	-3	0	-3	AG	284	1.6	0.0	12.9
D.	INDUSTR EBD	0	-3	200	-3	AG	620	1.6	0.0	6.3
E.	INDUSTR WBA	200	3	0	3	AG	283	1.6	0.0	12.9
F.	INDUSTR WBD	0	3	-200	3	AG	1488	1.6	0.0	6.3
G.	PARK SBA	-3	200	-3	0	AG	275	1.6	0.0	12.9
H.	PARK SBD	-3	0	-3	-200	AG	2010	1.6	0.0	6.3

LINK	* L (M)	* R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	18	18	1.8
RECEPTOR	2	23	23	1.8
RECEPTOR	3	28	28	1.8
RECEPTOR	4	33	33	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*		EF	H	W	
DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. INDUSTR EBA		-200	-3	0	-3		AG	685	1.6	0.0	6.3
B. INDUSTR EBD		0	-3	200	-3		AG	696	1.6	0.0	6.3
C. INDUSTR WBA		200	3	0	3		AG	669	1.6	0.0	6.3
D. INDUSTR WBD		0	3	-200	3		AG	755	1.6	0.0	6.3
E. I-680SBFSBA		-3	200	-3	0		AG	49	1.8	0.0	9.6

	*	MIXW											
	*	L	R	STPL	DCLT	ACCT	SPD			EFI	IDT1	IDT2	
LINK	*	(M)	(M)	(M)	(SEC)	(SEC)	(MPH)	NCYC	NDLA	VPHO	(G/MIN)	(SEC)	(SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	8	12	1.8
RECEPTOR	2	13	17	1.8
RECEPTOR	3	18	22	1.8
RECEPTOR	4	23	27	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. I-680SBNBD	3	0	3	200	AG	275	1.8	0.0	6.3
B. INDUSTR EBA	-200	-3	0	-3	AG	341	1.6	0.0	9.6
C. INDUSTR EBD	0	-3	200	-3	AG	473	1.6	0.0	6.3
D. INDUSTR WBA	200	3	0	3	AG	363	1.6	0.0	9.6
E. INDUSTR WBD	0	3	-200	3	AG	660	1.6	0.0	6.3

LINK	* L (M)	* R (M)	* STPL (M)	* DCLT (SEC)	* ACCT (SEC)	* SPD (MPH)	* NCYC	* NDLA	* VPHO	* EFI (G/MIN)	* IDT1 (SEC)	* IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	12	15	1.8
RECEPTOR	2	17	20	1.8
RECEPTOR	3	22	25	1.8
RECEPTOR	4	27	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	* *	LINK COORDINATES (M)				* *	TYPE	VPH	EF (G/MI)	H (M)	W (M)
		*	X1	Y1	X2	Y2	*					
A.	PARK NBA		3	-200	3	0		AG	50	1.8	0.0	19.5
B.	PARK NBD		3	0	3	200		AG	431	1.8	0.0	12.9
C.	BAYSHOR EBA		-200	-3	0	-3		AG	32	1.8	0.0	22.8
D.	BAYSHOR EBD		0	-3	200	-3		AG	562	1.8	0.0	14.6
E.	BAYSHOR WBA		200	3	0	3		AG	326	1.8	0.0	16.2
F.	BAYSHOR WBD		0	3	-200	3		AG	46	1.8	0.0	9.6
G.	PARK SBA		-3	200	-3	0		AG	505	1.8	0.0	16.2
H.	PARK SBD		-3	0	-3	-200		AG	417	1.8	0.0	6.3

LINK	* *	MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
F.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
G.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
H.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR	1	25	22	1.8
RECEPTOR	2	30	27	1.8
RECEPTOR	3	35	32	1.8
RECEPTOR	4	40	37	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*		EF	H	W	
DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. BAYSHOR EBA	*	-200	-3	0	-3	*	AG	979	1.8	0.0	9.6
B. BAYSHOR EBD	*	0	-3	200	-3	*	AG	39	1.8	0.0	6.3
C. BAYSHOR WBA	*	200	3	0	3	*	AG	680	1.8	0.0	9.6
D. BAYSHOR WBD	*	0	3	-200	3	*	AG	1278	1.8	0.0	6.3
E. I-680SB SBD	*	-3	0	-3	-200	*	AG	2000	1.8	0.0	6.3

LINK	*	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	L	R	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
	*	(M)	(M)										
A.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

RECEPTOR		X	Y	Z
RECEPTOR 1		8	15	1.8
RECEPTOR 2		13	20	1.8
RECEPTOR 3		18	25	1.8
RECEPTOR 4		23	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*		EF	H	W	
DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. I-680SBFNBA	*	3	-200	3	0	*	AG	451	1.8	0.0	12.9
B. BAYSHOR EBA	*	-200	-3	0	-3	*	AG	39	1.8	0.0	6.3
C. BAYSHOR EBD	*	0	-3	200	-3	*	AG	132	1.8	0.0	6.3
D. BAYSHOR WBA	*	200	3	0	3	*	AG	65	1.8	0.0	9.6
E. BAYSHOR WBD	*	0	3	-200	3	*	AG	695	1.8	0.0	9.6

* MIXW

LINK	*	L	R	STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	(M)	(M)	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)

A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	18	15	1.8
RECEPTOR	2	23	20	1.8
RECEPTOR	3	28	25	1.8
RECEPTOR	4	33	30	1.8

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK	*	LINK COORDINATES (M)				*		EF	H	W	
DESCRIPTION	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
AA. BAYSHOR EBA	*	-200	-3	0	-3	*	AG	979	1.8	0.0	9.6
BB. BAYSHOR EBD	*	0	-3	200	-3	*	AG	39	1.8	0.0	6.3
CC. BAYSHOR WBA	*	200	3	0	3	*	AG	680	1.8	0.0	9.6
DD. BAYSHOR WBD	*	0	3	-200	3	*	AG	1278	1.8	0.0	6.3
EE. I-680SB SBD	*	-3	0	-3	-200	*	AG	2000	1.8	0.0	6.3

* MIXW													
LINK	*	L	R	STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	(M)	(M)	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
A.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
1 RECEPTOR	1	8	15	1.8
1 RECEPTOR	2	13	20	1.8
1 RECEPTOR	3	18	25	1.8
1 RECEPTOR	4	23	30	1.8

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1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	0.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	10.0 DEGREES	TEMP=	15.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M)				*		EF	H	W	
	*	X1	Y1	X2	Y2	*	TYPE	VPH	(G/MI)	(M)	(M)
A. I-680SBFNBA	*	3	-200	3	0	*	AG	451	1.8	0.0	12.9
B. BAYSHOR EBA	*	-200	-3	0	-3	*	AG	39	1.8	0.0	6.3
C. BAYSHOR EBD	*	0	-3	200	-3	*	AG	132	1.8	0.0	6.3
D. BAYSHOR WBA	*	200	3	0	3	*	AG	65	1.8	0.0	9.6
E. BAYSHOR WBD	*	0	3	-200	3	*	AG	695	1.8	0.0	9.6

LINK	*	MIXW		STPL	DCLT	ACCT	SPD	NCYC	NDLA	VPHO	EFI	IDT1	IDT2
	*	L	R	(M)	(SEC)	(SEC)	(MPH)				(G/MIN)	(SEC)	(SEC)
	*	(M)	(M)										
A.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
E.	*	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	18	15	1.8
RECEPTOR	2	23	20	1.8
RECEPTOR	3	28	25	1.8
RECEPTOR	4	33	30	1.8

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